IRON & COAL TRADES REVIEW

JANUARY 29, 1960

Vol. 180

No. 4,776

ESTABLISHED 1866

Incorporating "STEEL and IRON" and "COAL"

Organ of the National Association of Colliery Managers and the Association of Colliery Managers in India

Published each Friday

Annual Subscriptions: United Kingdom....52s. Abroad....60s. Payable in advance

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IRON AND COAL
TRADES REVIEW

Vol. 180 January 29, 1960 No. 4,776

Location of Industry

THE Local Employment Bill now before the House of Commons seeks to repeal the Distribution of Industry Acts, 1945-58, and put in their place a single enactment more suitable to current economic conditions. It is assumed that while mass unemployment is unlikely to recur, distortions may well exist, the product *inter alia* of a number of factors, including technical changes such as the rapid extension of automation, the adoption of new processes, the use of substitute materials, and the switch to more economic forms of energy. Timely action it is thought would alleviate the distress created by the contraction of specific industries and provide for the building of new factories to take up workers displaced.

Powers scheduled to be granted authorize the Board of Trade to make the fullest use of industrial development certificates devised to inhibit manufacturers from building in congested areas. These powers will not, of course, direct industries to areas where a persistent rate of unemployment exists or is imminent. This purpose is achieved indirectly by a number of devices—persuasive in operation—enabling the Ministry to acquire land and build factories for renting, or alternatively to provide building grants coupled with powers to improve the amenities of derelict land for the purpose of attracting industry to an area. It will be noted, however, that while positive powers have quite properly not been sought in the private sector to direct industry to the areas in question, ample powers curiously exist in the public sector which ensure that the location of new installations are made in conformity with Government policy. For example, the location of new steel mills has been bedevilled by political and racial considerations. Economists would scarcely have approved the building of all Britain's strip mills in Wales, and more recently the criticism levelled at the decision to locate additional capacity in Wales and Scotland is not without substance. Perhaps a mill in England would have much to commend it, but apparently this has not received the support of the Iron and Steel Board.

It would certainly be wrong to assume that Britain is unique in this respect. Recently, it was decided to build a new steel plant at Taranto, in southern Italy, for operation by the State-owned entity, Finsider. The additional capacity required could have been afforded by expanding the capacity of existing plants. The proposals have been further criticized on the grounds that a plant at Bagnoli is more than sufficient to meet the requirements of the south of Italy. The authorities, however, argue that the new facilities will contribute to the industrialization of the south, and while the plant may prove surplus to immediate requirements, it may be justified when assessed as a detail in a long-term programme.

Scotland is disturbed that the rate of unemployment is 4.3 per cent. compared with 1.9 per cent. for the United Kingdom as a whole, and every effort is being made to attract new industries to the area north of the Tweed. It is thought that new undertakings will provide about a third of the jobs required, and steps have been taken to attract car manufacturers to set up assembly plants in the north. There are problems to be considered by any migrant manufacturer. It may be remembered that pursuant to Government policy the watch and clock industries built many of their plants in development areas, with consequent loss in economic advantage. They now complain that the policy has scarcely equipped them to meet the rigours of competition from rival traders in the European Economic Community and the European Free Trade Area.

Modern industry has many factors to consider before locating plant. Proximity to raw materials, essential markets, firms assembling vital components, and other considerations have all to be evaluated. The record of the area in industrial disputes may be material. The economic challenges of both the EEC and EFTA have to be assessed, particularly their long-term implications. Concentrations now proceeding apace in western Germany and France and sitings adopted with a view to adequate market coverage have been dictated more in response to future requirements than to readiness to remedy an immediate trade distortion.

It is axiomatic that full employment is essential in a modern industrial society. Not infrequently, however, in achieving it, economic factors are sacrificed which handicap industry in later years. The Local Unemployment Bill, embodying both positive and negative powers, is a good Bill. It provides inducements to companies prepared to establish facilities in scheduled areas and yet leaves the final choice to the manufacturer himself. Where errors are likely to be made is in the board room through authorizing firms to migrate to remote areas in the hope of cashing in on immediate advantages. Firms would do well to figure out the productive pattern of the United Kingdom in the late 60s and 70s and attempt to assess Britain's position in Europe during the period. No easy task; and yet so much depends on the correct answer.

Passing Thoughts . . .

SIR HAROLD WEST

INTEGRITY and moral courage, as well as ability, are the most important attributes of a good company secretary.—This was the decision of a panel (with Sir Harold West, former managing director of Newton, Chambers & Company, Limited, Thorncliffe, near Sheffield, in the chair) at a meeting of the Sheffield and District Society of Incorporated Secretaries.

While one political party is trying to ditch public ownership, the Conservative Party in the 1960s is the political party which is going to make a go of it, especially the Post Office.—MR. REGINALD BEVINS, *Postmaster-General.*

One way to ensure that each worker in a business gives of his best is to issue abrupt orders from the top, backed by the threat of the sack, but such a practice has only to be stated for its futility to become apparent. Management by imposition can today lead only to economic suicide. In its place there must be management by consent.—SIR FREDERIC HOOPER.

Away from the coalfields, it is to be feared, it will be quite unable to make economic sense of the mineworkers' claim for higher pay and fewer working hours.—Newcastle Journal.

With coal fighting for its life against oil, why is it so difficult to obtain? Why, for example, does a local coal office refuse to deliver orders of under 5 cwt., or even allow customers to collect hundredweights in their own cars?—Letter in The Guardian.

In this area [Farnham, Surrey] coal merchants take on average a fortnight to deliver, although their stocks are adequate. Yet I can telephone for oil in the afternoon and it will be here in the next morning.—Another letter in The Guardian.

A father on shift work can become the "odd-man-out" so far as his children are concerned, and if he is a regular shift-worker, permanent injury may be caused to the relationship between him and his children—Report prepared by more than 100 study groups for the British National Conference on Social Work.

Fuel oil runs our transport, heats our factories, and will soon warm many houses. It is the "life blood" of this country. Its source is controlled by people who are, admittedly, very excitable and decidedly changeable. Are we sure that the flow of our "life blood" will not dry up next week?—Letter in the Birmingham Post.

If you have actually been down a pit, or mixed for any length of time with colliers off duty, you will be shocked by the shallowness, the rationalizing meanness, of most post-war discussions about the miners' brief and partial prosperity.—RICHARD HOGGART, in a book review in The Observer.

Enormous sums of public money have been sunk in Richard Thomas & Baldwins. The firm has responded with efficiency and profits. It is because its profits are so large that the Tory take-over bidders are after it, no matter what damage and upset may be caused by their action.—Daily Herald.

If, as we are led to believe, the coal trade is in such a bad way, perhaps someone in authority can explain why tons of cement are being used to lay out concrete roads on to the coal dumps, and also why an up-to-date elaborate canteen is being built at the NCB offices at Cramlington when so many miners are being paid off in the same district every week.—Letter in the Newcastle Journal.

There must be more ulcers suffered by top men in bustling motor factories than in any other industry. They are constantly striving to beat the clock.—NORMAN WOODHOUSE, *in the Western Mail.*

The parties may disagree among themselves (and within themselves) about the need for further nationalization; but all politicians are unanimous in thinking that Parliament ought to establish a firmer control over the existing nationalized industries . . . Parliament has no effective means of checking whether the [National Coal] Board's latest revised plan is any more realistic than the previously discarded plans.—The Guardian.

In Wales we are lucky. Our coal is of a uniformly high quality, relatively clean to use. It is still a valuable asset for South Wales.—Western Mail.

A collier who had a pint or two was having a go at the coconut stall. With faulty vision he thought he had knocked one, and demanded his nut, which rightly the stallman refused. With a perverted idea of getting his own back, he went to a nearby garden and borrowed a linen line without getting the owner's consent. This he fastened to the back prop of the canvas stall, and the other end to the stationary hobby horses. A toot of the whistle, and to the tune of "Broken Doll" a new type of haulage was set in motion. Soon coconuts were to be had for the picking, but no one could shout "Police" for laughing.—"Colliery Cameo," in the Stoke-on-Trent Evening Sentinel.

Important industries which have operated on a fairly stable basis for the last 15 years have found their selling price structures completely dislocated by the rulings of the Restrictive Practices Court.—MR. W. I. FRENCH, *retiring president, at the annual meeting of Glasgow Chamber of Commerce.*

If the National Coal Board would spend a few million pounds of the substantial loan at its disposal as loans or subsidies to industrialists to enable them to convert their plants to coal firing, and to contractors and householders to instal automatic feeding boilers and grates in new buildings and houses, the industry would again assume its rightful place in the future economic development of our country.—W. CRAVEN LLEWELYN, in the Western Mail.

There is too much easy talk about the use of coal as a basis for chemical manufacture.—MR. R. G. BAKER, *president of the Institution of Mining Engineers.*

MR. SWARAN SINGH, Indian Minister for Steel, Mines, and Fuel, announced on Saturday that agreement in principle had been reached with the USSR to expand the productive capacity of the Bhilai steelworks from 1,000,000 to 2,500,000 tons annually during India's third Five Year Plan which begins in 1962.

In Parliament

MINISTER'S CONFIDENCE IN NCB

Stocking Cheaper Than Compensation

SEEKING to cut the high cost of stocking coal by ending open-cast mining, MR. GERALD NABARRO (Con.) on Wednesday moved an amendment to the Coal Industry Bill which was later described by the Opposition as "designed to cripple the Coal Board and weaken the industry's competition with oil." The MINISTER OF POWER, Mr. Richard Wood, told Mr. Nabarro that the cost of stocking coal this year would be considerably less than the cost of rupturing open-cast contracts.

Moving his amendment to reduce the capital sums made available to the National Coal Board up to 1965 by £25,000,000 to £675,000,000, MR. NABARRO said undistributed coal stocks had reached the phenomenal figure of 36,000,000 tons, worth £142,000,000—Coal Board money which was virtually sterilized. Open-cast mining in 1960 would produce 7,000,000 tons and about £28,000,000 would be tied up. The contracts covering all but 2,000,000 tons should be ruptured and compensation paid. The cost, surely, would not be as great as the £28,000,000 required to mine unwanted coal, he said. Contracts with the oil companies for oil for power stations should also be broken.

He estimated the total of the board's losses forward at the end of 1959 would be about £50,000,000 and that during 1960 there would be a further loss of £50,000,000. Was that £100,000,000 included in the Bill? Had the Minister taken that into account and also the probability of the board conceding the miners' pay claim costing £75,000,000—which would immediately "drive a coach and four through all the provisions of the Bill."

Mr. Wyatt's Offer

When MR. HAROLD FINCH (Lab.) remarked that the amendment was designed to cripple the board, MR. NABARRO retorted: "Rubbish." Nothing in the amendment impinged on its capital investment programme or its ability to compete with oil. MR. FINCH reiterated that that was what Mr. Nabarro was doing. Judging from the speeches, he said, one would imagine they were asking for a subsidy.

VISCOUNT HINCHINGBROOKE (Con.): "It amounts to that."

It was not a subsidy, MR. FINCH declared. It was a loan to be repaid with interest. The industry had never been treated as a commercial concern. The Opposition could agree that open-cast mining ought to be discontinued and that some power stations ought to revert to coal, but that was nothing to do with the amendment which would weaken the powers of the board. The Government should do for the industry a little of what it had done to help private enterprise.

Mr. Nabarro was offered £1 for every million tons of coal stocks above the present figure at the end of the year by MR. WOODROW WYATT (Lab.), who thought the Government had to shake up the Coal Board on its selling and advertising side. The board had started only a few months ago to acquire technical salesmen, but most of them, he understood, had little or no ability to sell the goods they were trying to sell. The board had only just begun a national advertising campaign to point out to big fuel users the advantages of coal and coke against oil. The oil companies, on the other hand, carried out ruthless and usually untruthful propaganda all over the country.

If the Minister was strapped down in one direction it would make long-term planning almost impossible and, therefore, he could not support the amendment, said COL. CLAUDE G. LANCASTER (Con.). He believed coal stocks would rise and that the Minister would be confronted with a difficult position by July. A great deal more could be done on the sales side in trying to sell coal oversea. The time should surely be coming for a diminution in price levels, making coal competitive with oil.

MR. PERCY BROWNE (Con.) supported the amendment, although, he said, he had no desire to hamstring the NCB. Speaking as a coal merchant he thought ways would have to be found to sell more coal to the domestic consumer. Far too much small coal was being produced when the domestic consumer wanted large coal, and costs were far too high.

The flaccidity which had characterized the finances of the nationalized industries, not only coal, since the end of the war, must be looked into thoroughly by the Government, said VISCOUNT HINCHINGBROOKE. "Surely these great nationalized concerns, which are meant to be great commercial concerns standing on their own feet, and told to do so by statute, should now be required to do so," he maintained.

The Government had a "Father Christmas" attitude towards many industries, but had adopted the attitude of a moneylender to the mining industry, said MR. JOHN MCKAY (Lab.).

MR. FREDERICK LEE (Lab.) asked why coal could not have any increasing use of the Treasury to finance its operations when Richard Thomas & Baldwins, Limited, part of the nationalized sector of the steel industry, had been granted an increase in the amount of its borrowing. Why had not the Conservatives made an attack on that issue? It was because it would be a further incentive for the private speculator to cash in on the fine achievements of RTB as a going concern.

If the amendment were approved his position would be quite impossible, said the MINISTER, replying to the debate. It had been on behalf of the Government that he had recently given approval to the revised plan for coal. That approval must carry with it the obligation to make available the necessary capital. "I

intend to do so, because the only interpretation that could be placed on a refusal would be that I have no confidence in the board's plans. In spite of all that has been said about our views on the future of the industry I have every confidence that the board can and will carry out the plans set before it," he declared.

There was only one way of reducing stocks more quickly and that was to see that production was below demand and stocks could not be run down more quickly unless they were prepared to cut production a good deal more. He did not believe there was any escape from this fundamental dilemma.

The cost of stocking coal on the ground, providing it was not added to this year, would be something like 4s. a ton. That would be considerably smaller than the cost of rupturing open-cast contracts. Other Government departments were to be asked to consider the merits of coal against oil and if the proper comparison was made he was certain that coal could hold its place.

He understood the Coal Board's deficit at the end of 1958 was something like £28,100,000 and that this year it was likely to be something over £20,000,000.

The amendment was rejected by 179 votes to 11.

MR. NABARRO'S second amendment—to reduce from £75,000,000 to £50,000,000 the permitted excess in any financial year over the highest aggregate amount outstanding during the preceding year was carried by 178 votes to 108. He understood, he said, the Bill included £50,000,000 for financing coal stocks. This was not a capital expenditure and in view of that intrusion it was necessary to reduce the sum and thereby ensure greater accountability to Parliament.

The Minister said the reduction would almost certainly mean an order in the 1960-61 financial year because the NCB's borrowings would probably exceed £50,000,000. The effect of the amendment would be to secure one extra debate on the coal industry sometime in the next 12 months. He certainly hoped the industry would be able to stabilize its position ready for an advance next year. It would be unreasonable to refuse consent for the amendment.

Snail-like Progress of Steel Denationalization

BOOK value of steel concerns still nationalized on October 3, 1959—the latest date available—was £92,000,000, said the CHANCELLOR OF THE EXCHEQUER reply to MR. GERALD NABARRO (Con.). This figure was the value of the net assets in the books of the Iron and Steel Holding and Realization Agency's remaining subsidiaries. ISHRA's prior charge holdings in and loans to companies already denationalized amounted to £147,800,000.

Nearly £250,000,000 of public moneys was at present invested in the steel companies, nationalized and denationalized, a sum practically as great as when the 1953 Act was put on the Statute Book, said MR. NABARRO.

Was not this snail-like progress towards total denationalization? Would the Chancellor see that the Conservative Party honoured its election pledges at the 1951, 1955, and 1959 general elections and completed the denationalization of steel and the winding up of ISHRA at a very early date?

MR. AMORY: "We can rely on the agency to proceed with its functions with all due speed bearing in mind the requirements that have been laid upon it."

MR. FREDERICK LEE (Lab.) suggested that Richard Thomas & Baldwins, Limited, had proved far more efficient, if judged either by the production of steel or the production of profits, than any other component of the steel industry and in spite of, or because of, that the Treasury was now handing it back to private enterprise.

MR. AMORY: "I do not possess the technical knowledge to differentiate between the different steel companies."

Earlier MR. CYRIL OSBORNE (Con.) asked the Chancellor if, in view of the dissatisfaction created by the equity of the denationalized steel firms which had appreciated in value being offered to the public and prior charge stocks which mostly stood at a discount being retained by the authorities, he would arrange that RTB capital be converted into all ordinary stock before being offered for sale to the public. This would avoid any prior charge stocks remaining in the hands of the authority.

The CHANCELLOR said that the 1953 Act laid down that ISHRA should return nationalized iron and steel companies to private ownership in such a way as to secure, without disregard to other relevant matters, that the consideration obtained was financially adequate. It must be left to the agency to decide the best way in which it could carry out its role.

MR. LEE agreed with Mr. Osborne, pointing out that the value of the ordinary shares of Colvilles, Limited, for example, had increased since 1955 from £13,000,000 to nearly £40,000,000 and this increase had gone to the pockets of private shareholders. Was not the sudden interest in RTB because last year its working profits increased by 26 per cent. showing the very great success of public enterprise in the steel industry?

Was there any reason at all for denationalization? asked MR. JAMES GRIFFITHS (Lab.). MR. AMORY replied that the success of the denationalized industries as well as those under public ownership showed that the steel industry was perfectly capable of being run efficiently under private ownership, much more than under public ownership.

BACM President's Confidence

SPEAKING at the annual dinner-dance of the North Staffordshire sub-branch of the British Association of Colliery Management on Saturday, the national president, Mr. J. A. Bullock, declared his confidence in the future of the coal industry and the successful outcome of its present troubles and difficulties. The association, he said, had a conservative outlook and background, but it was a trade union, looking upon itself as being a part of the National Coal Board but not responsible for what the board did.

Mr. Bullock, who is method study engineer of the Castleford Area of the North-Eastern Divisional Coal Board, said his loyalty was two-sided. When someone wanted his loyalty to get increased efficiency in the industry or to reduce the cost of production he was with them 100 per cent. If, however, he was expected to try to keep families in their present position, he would withdraw his loyalty.

The BACM president said that they could not be party to a policy of restraint and felt that the economic position of the industry would never be put right through the sacrifice of officials.

Mr. T. J. Seabridge, president of the West Midlands branch of the BACM, presided and welcomed the guests.

SHEET STEEL PLANS

SCOW Expansion Scheme Revised

CONSENT to a revised proposal by the Steel Company of Wales, Limited, for its " fourth development plan," which will increase the steelmaking capacity of the Abbey Works at Port Talbot from 3,000,000 to 3,600,000 ingot tons per annum and the company's production of sheet and tinplate by 400,000 tons per annum was given by the Iron and Steel Board at its meeting on Tuesday. In response to a request from the board, the company has decided to exclude from its present plan the hot strip mill.

The exclusion of the hot strip mill should, the board feels, prove a more economical way of securing an adequate margin of productive capacity over likely demand, while avoiding the risk of creating an undue excess of hot strip mill capacity and of widespread underloading for some years of these large units of plant.

The change has been made possible as a result of an offer by Richard Thomas & Baldwins, Limited, to roll slabs from the Abbey Works at the hot mill now under construction as part of its new Spencer Works at Llanwern, near Newport (Mon). The hot-rolled steel coils will be returned to SCOW for conversion into steel sheets and tinplate. The agreement between the two companies will operate for a minimum period of five years.

Steel Sheet Demand

The capital cost of the SCOW plan is now reduced from an original figure of £33,000,000 to about £20,000,000 and it is expected that the new plant will be coming into production approximately the same time as the hot strip mill at the Spencer Works.

The delay by the Iron and Steel Board in giving a prompt " go-ahead " to the SCOW plan was interpreted in IRON AND COAL of January 15 as a reluctance to solve a possible shortage of steel sheet and tinplate from the end of 1961 only to precipitate imbalance in supply and an unnecessary and serious competitive situation in this section of the industry in the long-term prospect.

The board estimates that the total demand for steel sheet and tinplate will rise from 4,600,000 tons in 1962 to 5,300,000 tons in 1965. The potential supply from existing works is put at 4,400,000 tons, and this is raised to 4,900,000 tons by RTB (200,000 tons), with Colvilles, Limited, as approved (100,000 tons) and the SCOW addition (200,000 tons), giving a 300,000-ton (6 per cent.) margin between demand and supply in 1962.

By 1965 RTB could raise the supply from existing works to the estimated total demand of 5,300,000 tons. With Colvilles as approved and its extension a further 5,000,000 tons would be forthcoming and the SCOW addition would by then add another 300,000 tons giving an 800,000-ton (16 per cent.) margin. In addition, in all the new schemes the estimates for 1962 have been heavily discounted to allow for any unexpected delays in construction.

In the past two years the production of sheet has risen from 2,200,000 tons to a provisional figure of 2,500,000 tons and tinplate from 1,000,000 tons to 1,100,000 tons, giving a total rise of 400,000 tons to 3,600,000 tons.

The board's consent to the expansions at the Abbey Works is conditional on arrangements being made to enable large ore-carrying ships of 25,000 tons upwards to be used. At present Port Talbot can only take ore-carriers of up to 8,000 tons and it is understood that the company is discussing with the British Transport Commission plans for improvements in the Port Talbot harbour facilities to overcome this difficulty.

Also on Tuesday the Iron and Steel Board approved a proposal by Colvilles to double the sheet capacity of its new Ravenscraig steel strip mill from 230,000 tons to 500,000 tons per annum. This is estimated to cost some £14,000,000. The additional coke-oven capacity which forms part of the extended proposals is the subject of consultation with the National Coal Board and others concerned.

In its quarterly magazine Colvilles refers to the surprising demand for steel strip which has already become apparent. " People approach us almost daily trying to book orders for strip. The orders are not small. They come from substantial firms eager to arrange regular supplies," it is stated. The Ravenscraig strip mill, designed to produce 500,000 tons of sheet a year is, however, capable of trebling its output if the demand warrants it.

The company also stated on Tuesday that the pig-iron and steel capacity at Ravenscraig is to be increased and there is to be a change from two single-stand cold-reducing mills to a more efficient 4-stand tandem mill at Gartcosh. The increase in pig-iron requires two additional blast furnaces at Ravenscraig instead of one, and two new batteries of coke ovens. Constructional details have been worked out and a large number of contracts have already been placed, while the remainder are now being completed. When the extension plans of the group are completed steelmaking capacity will be raised to 3,300,000 tons per annum.

The long-term future is secure, the company states, and partial recovery from the recession came faster than it had been dared to hope. Overall production is running within 10 per cent. of the boom peak of 1957 when the company was producing, on average, over 43,000 tons of steel a week. " Nine months ago we were down to 25,000 tons a week. Now we are back to 40,000 tons and still moving upwards."

One question facing Colvilles, however, is the rate at which the demand for the products of the heavy mills will build up. " There the future is far from clear," it is stated.

THE ADDRESS of the Bristol branch office of Brook Motors, Limited, Huddersfield, is now Refuge Assurance Building, 18, Baldwin Street, Bristol 1. The telephone number is unchanged.

126 Years of Sheffield History

THE head office of the United Steel Companies, Limited, was transferred from Westbourne Road, Sheffield, to new headquarters at The Mount, on Monday, and the central organization of a concern which, through its member companies has been connected with the development of the British steel industry and of Sheffield and Yorkshire for many years, is now housed in a 126-year-old building which is itself an integral part of more than a century of the city's history.

The Mount was designed in 1834 by William Flockton, a well-known Sheffield architect, as a block of eight private houses, and its pillared facade is now scheduled as of historic interest.

To serve the needs of United Steel in the second half of the 20th century the building has undergone extensive internal reconstruction and some of the 150 staff now housed at The Mount are accommodated in an entirely new three-storey block and interconnecting wing which has been built behind the main building. The original character of the old building has, however, been preserved.

The Mount became a place of local, national, and international fame from late 1835 when James Montgomery, the hymnwriter, journalist, and sociologist moved in.

Hardly an organization for intellectual, moral, or social improvement existed in Sheffield before Montgomery's arrival in 1792. Hardly one existed at his death which he did not help to form. A former editor of the Iris weekly newspaper, in the city, Montgomery was a pioneer in education and hospital service and a valiant fighter against slavery and the employment of children in chimney sweeping. He wrote hundreds of hymns and some, such as "Hail to the Lord's Anointed" and "Angels from the Realms of Glory," are still firm favourites.

John Holland (1794-1872) succeeded Montgomery as editor of Iris and also lived at The Mount and others of its many residents over the years have included industrialists, headmasters, ministers, and stationmasters.

In the last war it provided a haven for the department store of John Walsh, Limited, when the company's former premises were destroyed in the 1940 blitz. Walsh's sold the building to United Steel and work began on the conversion and addition to the premises in May, 1958.

Special features of the new building include a spacious printing department in which much of the general printing required by the company and its branches will be undertaken, and a mechanized accounts department. The latter incorporates an ICT 1202 electronic computer.

At the front of The Mount is an underground car park with accommodation for about 60 staff and visitors' cars. Above the car park it is intended to lay out a bowling green and flower beds in order to maintain the amenities of the largely residential neighbourhood.

The company's new address is: The United Steel Companies, Limited (G.P.O. Box 64), The Mount, Broomhill, Sheffield 10. The telephone number—Sheffield 60081—remains unchanged.

CARDIFF docks imported 774,109 tons of iron ore in 1959, compared with 745,943 tons in the previous 12 months.

New BMC Factories for Development Areas

HOPES in areas of greatest unemployment that relief would come from the motor-car industry have been realized. Negotiations with the Government by the British Motor Corporation, Limited, over its £49,000,000 expansion programme have resulted in the decision to spend nearly £21,000,000 over the next two years on building and equipping new factories to provide more than 11,000 new jobs in Scotland, South Wales, and Merseyside. Similar development plans by others of the "Big Five" in the industry are likely to follow.

BMC plans to move the manufacture of heavy commercial vehicles and tractors from Birmingham to Scotland where an £8,800,000 factory will provide jobs for 5,600. Another new factory costing £7,500,000 is to be sited between Llanelly and Trostre, near the sheet steel manufacturing resources of west South Wales and close to the Trostre works of the Steel Company of Wales, Limited. This plant, together with an extension of the existing radiator factory at Llanelly, will employ 4,200 and will provide pressings and major sub-assemblies for the Midlands works.

Third of the new factories will be a £4,200,000 plant at Kirkby, near Liverpool, employing 1,500 workers, where BMC intends to re-locate the domestic appliance production of Fisher & Ludlow, Limited.

While South Wales and Liverpool have warmly welcomed the BMC plans, Scottish industrial and union leaders, in their various ways, have voiced a wish that the share for Scotland, where unemployment in December rose to 98,000, could have been considerably more. Last week, Viscount Ridley, chairman of the Consett Iron Company, Limited, intimated that if the car industry were to develop on a large scale in the north-east, it could have supplies of sheet steel available within very easy reach.

Engineering Group's Good Outlook

WELCOME improvement in demand for all the group's products has been experienced in recent months by Brightside Engineering Holdings, Limited, Sheffield, following the difficult time in the early part of the year to September 30, 1959. The chairman, Mr. Ambrose Firth, considers the outlook for the current year to be "good" and, he says, there are already signs following the General Election of a resurgence in demand for the capital goods on which the group is so dependent.

Roll shops have been operating at an ever increasing rate to cater for steelworks and non-ferrous rolling mills throughout the world and export trade has remained particularly buoyant. A larger volume of work was handled by Brightside Heating & Engineering Company, Limited, the pipeline division of which makes progress, and there is a large order-book for work both at home and abroad. Moorwoods, Limited, has had a satisfactory increase in orders for catering equipment.

The dividend is 17½ per cent. (20⅝ per cent. equivalent for 15 months) on a doubled capital. In order to reduce the disparity between payments in future, the directors propose to adopt a 5 per cent. rate for the interim, subject to any unforeseen circumstances.

Heartening Success

SOUTH-WESTERN COAL BOARD'S FIRST PROFIT

FIRST profit in 12 years of nationalization is the 1959 achievement of the South-Western Divisional Coal Board. Not only was it the first profit, but, states the divisional chairman, Mr. D. M. Rees, in a message to all managers of collieries and NCB plants in the division, the board made £38,000 more profit than was expected a year ago. In addition to the profit of £417,992, coal stocks are being lifted and sold.

The overall result has been achieved in spite of the cost of stocking 1,604,263 tons and, says Mr. Rees, "we are heartened by this success which we are confident will be maintained and improved upon this year and in future years." While the board did not wish in any way to minimize the tasks and challenges which the future held for it and while it was realized that there were still a number of uneconomic and unsatisfactory units throughout the division, the present results were an example to everyone of what could be achieved.

Speaking at Caerphilly last Friday, Mr. Ness Edwards, MP, urged gas and electricity authorities and local councils to unite in backing the NUM in its fight against the competition of fuel oil. Failing the use of raw coal, gas, or electricity could rival oil for domestic or institutional central heating and there should be a co-ordinated campaign in Wales to get all local authorities to use coal, gas, or electricity for all their needs.

"If we cannot get co-operation for such a drive in the battle for coal at the London end there is no reason why a start could not be made in Cardiff," he said. "Let us have as much energy put into this exploitation of our natural resources as the oil interests put into their campaigns," he urged.

Increase in Manual Workers' Earnings

AVERAGE earnings of manual workers in October, 1959, showed an increase of 11s. 2d., compared with October, 1958. Between April and October earnings increased by 2.7 per cent., but wage rates rose by only 0.5 per cent. Average for all workers was £11 8s. 6d. a week and for men £13 10s. 9d. Men in manufacturing industries earned £14 1s. 3d.

In October average weekly hours were 46.7, compared with 46.3 six months previous, 46 in October, 1958, and 45 in April, 1947. Men worked about 48½ hours on the average, though the figure was slightly lower in manufacturing industries. The figures are taken from a Ministry of Labour survey of about 7,000,000 employees in a wide range of industries. Coal mining and the railways were the only major industries excluded.

MORE THAN 400 employees of Derby Cables, Limited, Derby, have had their working week reduced from 44 to 42½ hours with no loss of wages.

SOUTH WALES COLLIERY MANAGER TO RETIRE

ACKNOWLEDGMENT of the services to mining of Mr. W. G. Short was made at the annual presentation dinner of the Officials and Staff Association of Crumlin Navigation and Aberbeeg South collieries at Newport (Mon) on Saturday. Mr. Short, who is manager of the two collieries, is retiring after 52 years in the industry, the last 24 as manager at Crumlin and Aberbeeg.

He started work at the coal face in the Henwaun and Lower Deep collieries, but took up clerical work and at Six Bells Colliery graduated through most of the posts of responsibility to become manager. He took his mining degree at the Crumlin School of Mines (now the Monmouthshire Technical College). He was a member of the welfare committee of No. 6 Area of the South-Western Divisional Coal Board until it was disbanded and he also served on the divisional joint safety committee of the National Coal Board and the National Union of Mineworkers and the National Joint Pneumoconiosis Committee.

Mr. Short is a past president of the South Wales branch of the National Association of Colliery Managers and for four years a national vice-president. He is a founder member of the South Wales branch of the British Association of Colliery Management and is a former member of the National Consultative Council. In recognition of his services to the mining industry Mr. Short was made MBE in the 1956 Birthday Honours.

Carbon Black Concerns Merge European Interests

CO-ORDINATION of the manufacturing facilities of their two major plants in the European area is announced by the US concerns, Columbian Carbon Company and Continental Carbon Company. The former has purchased an interest in Continental's new £25,000,000 carbon black plant at Rotterdam and the plant will be operated by Continental-Columbian Carbon (Nederland) N.V.

Also announced is the purchase by Continental of an interest in the new carbon black plant being built by Columbian Carbon at Trecate, near Milan, Italy. International marketing for both plants will be handled by Columbian Carbon International, Milan (for Columbian Carbon), and Witco Chemical, Limited, London (for Continental).

Pits' Profitability and Nationalization

PROMPTED by comments made by Mr. Georg Tugendhat in the correspondence columns of The Times regarding the taking over of assets "at greatly inflated values" by the nationalized rail and coal undertakings, Col. Claude G. Lancaster, MP, replied last Friday. Col. Lancaster is chairman and managing director of the Bestwood Company, Limited, formerly the Bestwood Coal & Iron Company, Limited, and of Plowright Bros., Limited, colliery and mechanical handling engineers, etc., of Chesterfield, and a director of the Foraky Boring & Shaft Sinking Company, Limited.

Col. Lancaster questions whether the assets were taken over so expensively. The experience of his company, if not typical, was by no means unique. Two years prior to nationalization it had been independently valued at £6,000,000. "We received only £2,250,000 at vesting date," he states. All its pits were profitable, it had ample reserves of coal and within a few years the National Coal Board was making a net yearly return from its erstwhile undertakings equivalent to the capital value at which they had been acquired.

Moreover, Col. Lancaster continues, the company was in the process of sinking a new pit described a year or two after nationalization in Socialist propaganda as the most modern pit in Europe. "We had proved the coal, planned the pit, sunk one shaft and were in the process of sinking the second, erected a good deal of the surface machinery, and taken all the risks. It was worth £1,250,000 in the open market; we received £80,000.

"A few years later, when coal was being turned, it was worth £2,500,000, and today £5,000,000 is a modest estimate of its value."

Admitting the possibility that some concerns were overvalued, Col. Lancaster suggests that it was conceivable that under more vigorous and enlightened managements the nation might have got rather better value for its investments.

The following day Sir James Bowman, chairman of the National Coal Board, replied to Col. Lancaster's comments on the management of the coal industry under nationalization. Taking the results of the Bestwood group, which owned collieries in the most profitable coalfield and excluding the new colliery which was not in production in 1947, he compares the results of the collieries for 1947, immediately after nationalization, with those for 1958 (the last year for which the board's accounts have been published).

The board, Sir James maintains, had succeeded in increasing the collieries' output by 40 per cent. and their productivity by 30 per cent. and profits had multiplied three and a half times.

"Since it is claimed that these collieries were prosperous and efficient when the board took them over, the subsequent results provide the best possible evidence of the vigorous and enlightened management to which Col. Lancaster referred," Sir James says.

On Saturday Col. Lancaster briefly dealt with the profitability of the collieries. If they were making a net return equivalent to their capitalized value on acquisition this must have been due to two factors—their condition at vesting date and the development plans then in being. Moreover, after nationalization they had the good fortune to remain largely under their former management, he concludes.

European Coal and Steel Community's Advisors

ADVISORY committee of the European Coal and Steel Community has announced its members for the coming year. The chairman is Mr. Isaac Bart (representing Dutch steelworkers) and other members of the committee are:—Vice-president, Mr. Dominico Taccone (Italian steel consumers); vice-president, Mr. Paul Baseilhac (French coal producers); Mr. Eric Conrote (Luxembourg steel producers); Mr. Mattieu Thomassen (Belgian coal workers), and Mr. Paul Roth (West German coal consumers).

The committee, which is based in Luxembourg, followed its formation with a meeting at which continued unemployment relief payments to Belgian mineworkers in the period from January 1 to September 30, 1960, was urged. The ECSC High Authority's plan to set a sum of $2,800,000 to research into industrial diseases and complaints in the steel and coal industries was also unanimously supported.

In the claim brought against the High Authority by the Federal German Government and 18 German industrial concerns before the European Court of Justice concerning Authority decisions in the question of exceptional transport tariffs for ECSC raw materials, M. Lagrange, counsel for the High Authority, has urged that the claim should be dismissed as unfounded and the claimants made to pay costs.

The Authority last week announced its plan for the continued payment of compensation to Belgian mineworkers. This plan envisages a gradual cutting down of compensation for lost shifts and a placing of $3,000,000 for payment of compensation for the period ending September 30 next. Some 20 per cent. of the basic pay of mineworkers affected by the crisis in Belgium will be paid from High Authority funds.

Good News for South Wales Coal Industry

ENCOURAGING news, particularly for South Wales miners, was given by Mr. Eric David, deputy divisional marketing manager of the South-Western Divisional Coal Board, speaking last week at a meeting of Pontypridd and District Chamber of Trade and Commerce.

Next year, he said, 1,000,000 tons of coal would be ordered by Richard Thomas & Baldwins, Limited, for its new £110,000,000 steelworks at Llanwern, Newport, and the new power station at Aberthaw, near Barry, would eventually use 1,500,000 tons of small coal a year. It was also expected that a substantial order for steam coal to power the boilers at the Llanwern works would be placed.

Turning to competition from oil, Mr. David said: "We are convinced that many consumers have been persuaded to change to oil without fully appreciating the results which can be achieved by coal when used in up-to-date equipment." The comparisons which had been put before them were those obtained from oil in modern plants against existing old-fashioned and inefficient coal-fired appliances.

"In fact," he said, "far too many plants for steam raising are converting to oil where the advantage in overall cost of production is often negligible." Large and prosperous firms had pinned their faith to coal and, he added, "we may yet see the day when all the best people will burn coal."

Rate of Coal Output

EFFECT OF NCB MEASURES

WHILE transport difficulties are undoubtedly having a marked effect on replenishing consumers' coal stocks, there still appears to be a reluctance in all sectors to build up stocks, and in the week ended January 16 distributed stocks dropped by 400,000 tons. Greater activity in this department would hasten the rate at which undistributed stocks are dwindling—by 173,000 tons in the same period. Consumption, meanwhile, at 4,622,000 tons is well above total output.

Production last week dropped by about 0.5 per cent., but at 4,076,300 tons it was some 7 per cent. less than the comparable week last year. Overall the rate of output is about 6 per cent. below that of a year ago. Productivity continues its upward climb and in the week ended January 16 it reached 77.32 cwt. at the face and 27.58 cwt. overall, compared with 72.38 cwt. and 26.6 cwt. a year ago.

There were 632,400 wage-earners on colliery books on January 16, against 680,800 on January 17, 1959, the numbers engaged at the coal face being 242,000 and 265,700, respectively. Total absenteeism (all workers) in the week ended January 16, was 14.28 per cent., compared with 14.65 per cent. in the week ended January 17, 1959. Output at the face was 3.866 tons and overall 1.379 in the week ended January 16, compared with 3.619 and 1.330 in the week ended January 17, 1959.

The following table gives (in tons) the output of saleable mined coal by division in the week ended January 23, and the tonnage lost through all causes (holidays, disputes, and go-slows):—

Division.	Week ended January 23, 1960.		Week ended January 24, 1959.
	Total output.	Tonnage lost.	Total output.
Scottish	369,200	3,100	390,600
Northern (N & C) ..	245,700	400	267,000
Durham	466,500	—	481,700
North-Eastern ..	849,400	9,600	900,300
North-Western ..	274,000	1,100	305,700
East Midlands ..	916,900	400	955,300
West Midlands ..	307,700	3,500	341,900
South-Western ..	416,600	3,800	445,800
South-Eastern ..	34,400	—	34,400
Great Britain—			
Deep-mined coal ..	3,880,400	21,900	4,122,700
Other deep-mined (including licensed mines) ..	48,800	—	55,600
Open-cast coal ..	147,100	—	208,300
TOTAL	4,076,300	21,900	4,386,600

SIGMUND PUMPS, LIMITED, Gateshead, has completed a 30,000 sq. ft. extension to its machine and assembly shops. A new foundry of 21,000 sq. ft. is also under construction and will be ready to start operations in March. In addition, a new subsidiary of the company is to take over 64,000 sq. ft. of factory space on the Team Valley Trading Estate. This will provide work for 300 men and women when it is in full production. Sigmund Pumps is a member of the Booker Bros. & McConnell group of companies.

Brodsworth Colliery "On View"

PART of the extensive £3,300,000 reconstruction scheme which is to boost annual output at Brodsworth Colliery, near Doncaster, from the present 1,450,000 tons to 1,680,000 tons and which will require an extra labour force of 800 was shown to journalists last week.

Since mechanization began in 1954, Brodsworth's power-loaded output has been increased to 63 per cent. In 3-ton mine cars the coal is raised 2,550 ft. to the surface in 60 seconds. The degree to which full automation will be introduced—six of the colliery's 18 faces are as yet not power-loaded—will depend upon market demand and the perfecting of power-loading machinery.

The trend is continued on the surface where integrated electrical relays give high-speed winding of the coal at the touch of a button. The engineman can have the 22-ton capacity skip hauled to the surface, discharged, and returned to the pit bottom in just three minutes.

The multirope skip, operated by 2,700 h.p. electric winding gear, is the biggest in Europe.

Also at the pithead added space has been provided for the miner to park his car. He can walk from the pithead baths along enclosed gangways and descend in the world's largest pit cage—it holds 140.

Mr. Norman Hulley, Area general manager of the Doncaster Area of the North-Eastern Divisional Coal Board, pointed out that the whole project is being carried out not only without loss of production but at a time when production continues to increase. For the miner as much as possible is being done to make his job less arduous and to provide as much comfort and amenities as possible. "There is no reason," Mr. Hulley said, "why a man here should not have the same pride in his pit as the worker in a first-class factory."

New Tunnelling Record

BY tunnelling 107 yds. 4 in. in seven days a National Coal Board team of 24, working at Bank Hall Colliery, Burnley, has set up a new British tunnelling record. The previous seven-day record was 105 yds. 6 in.

To achieve the record the team had to drive the tunnel through shale, sandstone beds, and cannel, and 7,213 tons of coal and about 4,700 tons of debris were removed from the pit in a week.

Personal

New President for FMCE

PRESIDENT of the Council of Underground Machinery Manufacturers since May, 1957, Mr. A. YORKE SAVILLE has succeeded Mr. Edward Burgess, chairman and managing director of Marshall Richards Machine Company, Limited, as president of the Federation of Manufacturers of Construction Equipment.

MR. A. YORKE SAVILLE

Mr. Yorke Saville, who is chairman of British Jeffrey-Diamond, Limited, Wakefield, began his career in the experimental and testing department of British Spiro Turbine, Limited, an associate company of the Diamond Coal Cutter Company, Wakefield. The interests of the two companies were acquired by the US concern, Jeffrey Manufacturing Company, in 1928, and Mr. Yorke Saville has held a number of appointments with the firm. He is also chairman and managing director of Construction Machinery, Limited, an associate company of BJ-D. A member of the Institution of Mechanical Engineers, he is also a member of the management board of the Engineering and Allied Employers' National Federation.

Mr. ARTHUR RADFORD, commercial manager at the Codner Park Forge and Rolling Mills of the Butterley Company, Limited, Derby, has retired after 47 years' service with the firm.

Sir RICHARD YEABSLEY, former deputy chairman of the Peterborough diesel-engine firm of F. Perkins, Limited, has been co-opted to the board of directors of the State Building Society.

Mr. W. E. JONES, who is shortly to retire as president of the National Union of Mineworkers, received a presentation from the Scottish Colliery Enginemen, Boilermen and Tradesmen's Association in Glasgow last week.

Sir PATRICK LINSTEAD, Rector of the Imperial College of Science and Technology, London University, has accepted an invitation to become chairman of the British Council's science advisory committee and a member of the council's executive committee.

Brig. H. P. CROSLAND, chairman and managing director of Metal Traders, Limited, and a director of Metal Market & Exchange Company, Limited, has been elected chairman of the Zinc Development Association for 1960. The former chairman, Mr. R. T. DE POIX, will remain a member of the council.

Prof. J. FLEETWOOD BAKER, FRS, Professor of Mechanical Sciences and head of the Department of Engineering of Cambridge University, will be among those who receive honorary degrees from Lord Salisbury, Chancellor of Liverpool University, at a congregation on April 30. He will receive the degree of Doctor of Engineering.

Mr. C. W. HAMILTON, managing director of McCall & Company (Sheffield), Limited, and McCalls Macalloy, Limited, has been elected president of the Prestressed Concrete Development Group for the coming year. Mr. Hamilton, who has been connected with prestressing from its early days, is also chairman of the Reinforcement Manufacturers' Association.

Chairman and managing director of the Standard Piston Ring & Engineering, Company, Limited, Sheffield, 84-year-old Mr. GEORGE BIRCH retires from active control of the firm this weekend. He joined the company as works manager in 1900 and became chairman nine years ago. Soon after he joined the firm, Mr. Birch played a big part in its expansion, when advantage was taken of current developments in internal combustion engines. He was appointed to the board in 1917 and became managing director in 1939. Mr. Birch will remain chairman of the company and has agreed to act as consultant.

Mr. HUGH PURSLOVE BARKER, chairman and managing director of Parkinson Cowan, Limited, London, S.W.1, has been elected chairman designate of the British Institute of Management. He will succeed Lord Verulam at the institute's annual meeting in October. Mr. Barker joined the board of Measurement, Limited, a Parkinson Cowan subsidiary, in 1938. In 1940 his company released him for service with the newly-formed Ministry of Aircraft Production, where he worked for four years, latterly as deputy director of instrument production. Shortly before the end of the war he returned to Parkinson Cowan as engineering director and was soon afterwards appointed managing director. He has also been chairman since 1956.

EMI Offer for Lancashire Dynamo Unchanged

DECISION not to step up its bid for Lancashire Dynamo Holdings, Limited, in answer to the improved offer by Metal Industries, Limited, was announced by Electric & Musical Industries, Limited, on Wednesday. Terms of the EMI bid, made two weeks ago, are 42 EMI ordinary for every £100 of preference stock and 150 ordinary for every £100 of ordinary stock.

Terms of the improved MI offer were 120 5 per cent. cumulative preference for every £100 of preference stock and for each £1 of ordinary stock either one MI share and 12s. in cash or half a share and 45s. in cash.

The directors of Lancashire Dynamo have again recommended a merger with EMI which, they believe, offers better prospects. They say that future development of Lancashire Dynamo, particularly in electronics, would be achieved more rapidly in conjunction with EMI which has "the necessary technical and research resources as well as adequate finance."

No AEU Overtime Ban at Wellingborough Iron Company

IN a report published in our January 15 issue concerning the blowing-in of one of the two idle blast furnaces of the Wellingborough Iron Company, Limited, a subsidiary of Stewarts and Lloyds, Limited, it was stated that two of the three blast furnaces at the company's works had been idle since 1957 owing to reduced demand for pig-iron and a ban on overtime by the AEU.

The parent company informs us that the reference to a ban on overtime by the AEU is untrue. We regret publication of the statement and are glad to give prominence to the correction.

IRON AND STEEL IN 1959

Year of Sensational Recovery

Highlights of the British iron and steel industry in 1959 *brought out in this special survey by* IRON AND COAL *have been the sensational recovery from slump to boom, which has made possible an increase in ingot output to* 20,200,000 *tons—*600,000 *tons better than in* 1958*—new records of production in the later months of the year, aggregate exports only slightly below the highest peak in the post-war years, and an acceleration of development plans designed to raise steel production to* 24,000,000 *tons in the current year and an ultimate capacity of* 30,000,000 *tons.*

SEEN in retrospect, the year 1959 must rank as the most eventful period in the post-war history of the British steel industry. After a continuous rise in production for more than 10 years, the industry was plunged into a deep depression in the early months of 1958, and this was continued for the greater part of last year.

The American steel strike, the longest and most costly in the annals of the Republic, produced similar distortions in the US economy, and, finally, on October 8 the death knell of nationalization of the steel industry was sounded by the British electorate. The revival of the steel industry had begun before the declaration of the polls, but the result gave a tremendous impetus to the market and the steel industry begins the new year on the crest of the wave.

Outputs have reached record heights and are still advancing; new techniques have enabled producers to achieve substantial economies in costs, and with modernized equipment British steelmakers are in a strong position to command a growing share of world trade.

Industry is not Complacent

Complacency is one accusation on which the steel industry is entitled to a complete acquittal. It is alluringly easy to plan for expansion—the flood tide of success: adversity is a powerful deterrent. It stands to the credit of the British Iron and Steel Federation that, in close consultation with the Iron and Steel Board, carefully compiled estimates of the nation's probable requirements were prepared, and that the very considerable expansion programme had been pursued with unabated vigour during a period of depression certainly unequalled since the 1930's.

It was a decision enshrouded with difficulties, of which the most evident was the prevailing redundancy of plant and personnel. Relatively few men were dismissed, the human problem of unemployment being mitigated by the willing co-operation of the men in a general reduction of the number of shifts worked at the steel furnaces and rolling mills —a system, in fact, of work sharing.

Redundancy, which for a long time amounted to as much as 30 per cent. of capacity, provided the opportunity for the final scrapping of plant which had long become an economic anachronism. Undoubtedly this process, now nearing completion, will give a pronounced impetus to the advancement of the industry towards the beckoning goal of top industrial efficiency.

A much more formidable obstacle to the substitution of new plant for old, plus the provision to increase capacity to 28,000,000 or possibly 30,000,000 tons by 1962-63, was that of finance. To provide for an annual capital expenditure of £100,000,000 or more was in any circumstance a heavy financial burden, rendered all the more formidable by the sharp pre-election warning of the Labour Party that if returned to power, one of the first items in its Parliamentary programme was the presentation of a Bill to re-acquire the properties of the private investor in steel.

Inevitably the political risk drove steel equities out of favour and the leaders of the industry made no attempt to conceal their anxieties concerning the provision of the immense aggregation of capital required to carry their development plans to completion. State loans of £70,000,000 and £50,000,000 were guaranteed for the completion of the two strip mills in South Wales and in Scotland, but for the rest, the industry was left to its own financial devices.

Removed Threat of Nationalization

Happily the dilemma has been solved by the synchronization of a steel trade revival and the removal—it may be for years and it may be for ever —of the threat of nationalization. The boom in steel equities began before the general election; it has since become astronomical.

Stewarts and Lloyds, Limited, has already capitalized its liabilities by a new issue to shareholders, and by a complex structure of loans from the Finance Corporation, overdraft facilities, and the issue of convertible debenture stocks the South Durham group has made full arrangements to finance its new development plan, which includes a new plate mill and slabbing mill, at an estimated cost of £55,000,000.

Other issues of a similar character may be expected. The financial difficulties have been largely overcome and the Iron and Steel Board in conjunction with the British Iron and Steel Federation has already embarked upon the task of preparing estimates of the probable trend of steel demand

up to the end of the 1960's, and, on the basis of these estimates, deciding the shape of the industry's third development plan.

Nine or 10 years is a long time to look ahead, particularly when such huge capital commitments are involved. But we already know that big development plans already in progress may take another four years to complete, and although the two new strip mills are urgently needed, it is not expected that they will become fully operative before 1965.

In the steel industry there must be forward planning and it will be interesting to observe, when the information is available, what are the changes envisaged in the latter half of the new decade.

Challenge of Alternative Metals

Changes of some sort may be accounted among the near certainties of the next few years, since the boundaries of the traditional fields of metal usage are themselves constantly shifting. The significance of the advances made by aluminium, magnesium and titanium cannot be ignored. One of the surprising features of the design of the world's greatest passenger liner, for example, is the installation of a superstructure fashioned entirely of aluminium. Steel, moreover, is but one of a number of metals which are confronted with growing competition from the rapidly expanding plastics industry.

Nevertheless, the supersession of steel by other materials has been confined within narrow limits which have been countered by the adaptability of the industry to meet the ever changing and ever expanding world demand.

One amongst many examples may be cited. The building of atomic power stations, now gathering momentum, has called for new and improved types of plates for the reactor shells. Probably no greater tonnage is required at present for this purpose than was previously used in the building of coal-fired power stations. But the change was not unforeseen. The provision of heat-resisting steels for the atomic age has not been neglected and the rewards are now accruing.

The essential fact is that world consumption of steel is expanding at breathtaking pace. Between 1945 and 1957 it has been multiplied two-and-a-half times, and the setback in the last two years has been caused not by any reduction in world requirements, but by the more limited purchasing power of the primary producing nations.

Increasing Production Oversea

In any event, the supposedly temporary shrinkage of production has not been universally spread. Soviet steel output has continued to advance, overtopping the combined figures of the six nations affiliated to the ECSC. China and India are engaged in feverish efforts to turn out more steel, with present outputs pitifully small in relation to the national needs of these great sub-Continents, and great nations of the Commonwealth—Canada, Australia and South Africa—have all embarked upon big development schemes.

Final statistics of world steel production in 1959 are not yet available, but a widely supported forecast is that the record figure of 289,000,000 tons in 1958 will be exceeded, and this despite the heavy loss of production in the US owing to the 117 days' strike.

It has been a record year for steel production in West Germany, France, Japan, and the Benelux countries. Russia and Canada are believed to have attained new peaks of production, and the continuing expansion of capacity is matched by a growing world demand.

TABLE 1.—*World Steel Production.*

Year.	Tons.	Year.	Tons.
1945 ..	112,900,000	1952 ..	208,060,000
1946 ..	109,540,000	1953 ..	230,850,000
1947 ..	133,800,000	1954 ..	219,830,000
1948 ..	153,360,000	1955 ..	265,010,000
1949 ..	157,860,000	1956 ..	278,480,000
1950 ..	186,450,000	1957 ..	287,000,000
1951 ..	207,680,000	1958 ..	289,000,000

Most of the nations of the world have begun to realize, as Britain has done for many years, that a vigorous and efficient steel industry is an essential element in the equipment of a country which acknowledges its manufacturing capacity as the principal means of its livelihood.

We have held our own, and in fact slightly increased our direct exports of unfabricated steel during a year of recession, but an even larger tonnage was indirectly exported in the form of motor vehicles, machinery, ships, etc. The steel sector, in fact, accounts directly and indirectly for over half the total exports.

These considerations have undoubtedly excited the envy and the cupidity of the Labour Party, now condemned for the third time to a prolonged period of political exile. In three successive general elections it has placed the renationalization of the industry in the forefront of its political programme and thrice its plan to bring the industry into the orbit of State ownership with all the disastrous consequences which have characterized bureaucratic control of other trades and industries have been repudiated.

Will Labour accept the emphatic verdict of the electorate? It has ample time to ponder its decision. Possibly the idea will be quietly interred. No matter whether steel has been granted an absolute reprieve or merely a respite, it has been assured of possibly four or five years to work out its own destiny freed from the meddlesome interferences of a biased political party.

1959 Target Exceeded

Already the assurance of this freedom has been the inspiration of a boom which has restored British steel plants to pulsating activity. It has enabled the industry to exceed the 1959 target of 20,000,000 tons, an event which four months ago seemed

wildly improbable, and brings promise of new production records in the year ahead.

US Steel Strike

The third decisive event of 1959 has been the most severe nation-wide strike in the US steel industry's troubled history. It began in mid July and only ended 17 weeks later by President Eisenhower's declaration of a national emergency and his invocation of the provisions of the Taft-Hartley Act, to which the 500,000 impoverished strikers made prompt, and probably not wholly reluctant, submission.

The cooling off period of 80 days has sufficed to bring about a negotiated settlement of the dispute. Continuity of operation of the US steel plants is assured and the industry is working in top gear to overcome the arrears in deliveries. But the settlement was only achieved at the price of a further inflation of the wage bill and the exposure of the industry to the competition of cheaper steel from European sources.

Production

The final statistics of British steel production reveal that the total output for last year corresponds very closely to the original target indicated by the Iron and Steel Board just a year ago. What the board cannot have foreseen was the depression into which the industry was plunged for the greater part of the year. By the end of July steel production had sunk to its lowest level, and although there were faint signs of recovery in the ensuing month, few could have foreseen the extent of the renaissance which has since developed.

If the Government is to be blamed, as it was in less well-informed quarters, for the imposition of restraints upon national and individual expenditure, that policy has since been abundantly justified. The nation's credit was restored, external trade balances steadily moved in our favour and at long last the brakes have been released on private expenditure and public investment on capital enterprises.

Much has been heard of late of the volume of unemployment. There are areas in Scotland, for example, in Lancashire and in the mining districts of South Wales, where unemployment has become a grave social problem, which the Government has made it a first task to overcome by the direct encouragement of the location of new industries where trade has receded. But there are other areas where labour shortages exist and an overall unemployment rate of less than 2 per cent. has always been accepted by economists as an index of high prosperity.

To that happy condition the steel industry is now rapidly advancing. After the summer holidays the great body of steel users began to revise their views. In 12 months their reserve stocks had been run down to the extent of approximately 750,000 tons and deliveries up to that point were still falling short of consumption.

This, however, was not the only, or even the principal factor which inspired the revival. The boom in the motor vehicle industry had assumed such overwhelming proportions that a shortage of sheet steel developed.

The re-rolling industry was restored to full scale activity, and if the requirements of the shipbuilding, mining, and transport industries were and still are below normal, the demand for heavy steel products for atomic power plants and most of the various branches of the engineering and constructional trades has moved steadily upwards.

The result is that at the beginning of another year the industry is working at not less than 92 per cent. of capacity. The October ingot output was only 0.5 per cent. below the record annual rate of 23,046,000 tons attained in May, 1957.

Production has since continued to expand and in the final quarter of 1959 crude steel production was almost 30 per cent. higher than a year earlier.

TABLE 2.—*Production of Crude Steel*, 1958-1959.

	Weekly average,		Per cent. change.	Steelmaking capacity. Percentage worked.	
	1958. '000 tons.	1959. '000 tons.		1958.	1959.
1st Quarter	421.1	356.2	−15.4	92.9	75.6
2nd Quarter	388.4	386.9	− 0.4	85.1	81.8
3rd Quarter	327.0	366.2	+12.0	77.3	83.9
4th Quarter	342.2	443.4	+29.6	75.1	93.4
Year ..	369.2	388.2	+ 5.2	82.6	83.8

Pig-iron production is closely regulated by the requirements of the steelworks, and blastfurnacemen confronted with reduced demands from that source were unable to discover any compensating factor in their deliveries to the ironfoundries. Quite a number of blast furnaces have consequently been on the unemployed list for the greater part of the year.

The Ironfoundries

The autumn revival has enabled a few blast furnaces to resume operations and the services of others will probably be called on very shortly. But expansion is still mainly confined to the furnaces producing basic iron for the steel plants and the manufacture of foundry iron remains restricted by the slow improvement in the call for iron castings. For the greater part of 1959 there was a surplus of high-phosphorus iron for which blastfurnacemen were glad to find markets oversea.

Productivity, however, is not measured solely by statistics of output. Average productivity is at present estimated at slightly below 1½ tons of steel per week for each individual of the labour force employed. Compare this figure with the expressed intention of achieving outputs of over 3 tons per man at some of the newer plants, and it will be seen that there is wide scope for advances in Britain, as there have been on the Continent and in the United States.

Third Development Plan

This indeed is the main purpose of the third development plan which is now being pressed forward to completion with renewed vigour. It is a costly adventure. Sir Ellis Hunter, chairman of Dorman, Long & Company, Limited, and for many

years president of the British Iron and Steel Federation, recently affirmed that the cost of a new fully integrated steelworks with a continuous strip mill might range as high as £15,000 per man employed.

Capital charges of such magnitude cannot be ignored. They support Sir Ellis's conclusion that there were strong inducements for the development of existing works to the limit of their capacity. It is significant that in spite of the enormous expansion of the US steel industry since the war, only one new plant has been erected on a virgin site.

These considerations emphasize the need for the greatest care in formulating further development proposals, since the individual companies are charged with the responsibility of financing them. Capital expenditure has recently been running at an annual rate of over £100,000,000 per annum and the prospect is that this figure will be maintained and possibly exceeded in the early years of the seventh decade. Table 3 is a summary of the yearly capital expenditure on development schemes in the post-war years.

TABLE 3.—*Capital Expenditure on Post-war Development Schemes.*

Year.	Capital expenditure.	Year.	Capital expenditure.
	£		£
1946 ..	5,000,000	1953 ..	49,000,000
1947 ..	30,000,000	1954 ..	52,000,000
1948 ..	40,250,000	1955 ..	58,000,000
1949 ..	50,250,000	1956 ..	75,000,000
1950 ..	56,750,000	1957 ..	95,000,000
1951 ..	62,500,000	1958 ..	105,000,000
1952 ..	65,000,000		

Are these colossal expenditures really necessary? The industry answers with an emphatic affirmative. The post-war shortages have now been largely if not wholly overcome. Competition in the world markets is expected to intensify. European and American steel plants have obtained a high degree of efficiency and the rise in the production capacity of the Soviet bloc opens up the prospect of increasing competition from the countries behind the Iron Curtain. Many other newly developing countries have embarked on steel development plans to meet their own national requirements, and, needless to say, these new plants embody all the latest techniques which have been evolved in recent years.

Need for Economy and Efficiency

If this country is to retain its position as a great manufacturing nation, if our own industries are to continue to enjoy the benefit not only of cheap supplies, but also of material which fulfils the more exacting standards of the new world, the pursuit of economy and efficiency in steel production must be continued with unrelenting vigour.

These are the considerations which have prompted the great projects now in hand for the provision of more modern strip mill capacity, for more four-high plate mills, continuous billet mills, and universal beam mills. "We cannot be certain that our forecasts will prove to be correct," says Sir Cyril Musgrave, the new chairman of the Iron and Steel Board, "but the consequences of being greatly wrong are serious."

The basic truth which has inspired the progressive policy of the British steel industry is that there can be no pause in the advance towards higher efficiency. Sir Walter Benton Jones has revealed that as a result of developments at Appleby-Frodingham, it is now possible to make twice as much pig-iron in existing blast furnaces as was possible 10 years ago and at the same time to reduce fuel consumption by one third.

Similarly United Steel has proved the efficiency of the Ajax steel furnace. Results of the conversion of two open-hearth furnaces to the use of bulk oxygen has involved only a relatively small capital expenditure, and has increased the production of these furnaces by no less than 75 per cent., besides reducing fuel consumption by 70 per cent.

Such achievements cannot be ignored. They are probably the starting point of revolutionary changes in steelworks practice which promise to keep British steel in the van of progress.

The Stockpiles

It is now more clearly apparent that the 1958-59 recession was aggravated by the general reduction of consumers' and merchants' stocks. Those stocks were reduced in the space of 18 months by just over 1,000,000 tons.

When supplies were abundant, it was no longer an economic proposition to lock up capital in the retention of stocks unwanted for early use; extensive reduction of the stockpiles was one of the main causes of the recession.

The turning point has now been reached. The purchase of most descriptions of steel products for prompt delivery is now rarely possible and consumers are believed to be restocking on a considerable scale.

This, of course, is one of the normal means of adjustment of supply and demand. Just as it was the tendency a year ago to accentuate the decline, so has the reverse process given a powerful impetus to the swelling tide of orders for iron and steel which is now much in evidence.

TABLE 4.—*U.K. Iron and Steel Production in* 1959.

Month.	Pig-iron.		Steel ingots and castings.	
	Weekly average.	Annual rate.	Weekly average.	Annual rate.
	Tons.	Tons.	Tons.	Tons.
January ..	228,700	11,894,000	356,900	18,560,000
February ..	221,800	11,536,000	347,400	18,065,000
March ..	221,200	11,501,000	362,700	18,860,000
April	231,300	12,027,000	387,300	20,139,000
May	240,500	12,504,000	384,600	19,999,000
June	235,300	12,235,000	388,500	20,200,000
July	221,600	11,521,000	320,300	16,654,000
August ..	219,600	11,418,000	337,100	17,527,000
September ..	251,100	13,057,000	426,400	22,171,000
October ..	269,800	14,029,000	441,400	22,953,000
November ..	277,300	14,422,000	458,600	23,847,000
December ..	280,400	14,583,000	432,900	22,513,000

Controls and Prices

For more than a quarter of a century the steel industry has operated under some form of public supervision. That supervision is now exercised

by the statutory Iron and Steel Board, appointed by the Ministry of Power and comprising, in addition to the chairman, Sir Cyril Musgrave, and two full-time members nominated by the Ministry, representatives of the iron and steel users, makers, and trade unionists.

Among the far reaching powers exercised by this authority is the fixing of maximum prices payable by the main users of all the manifold products of the steel industry. This system, cheerfully accepted by the manufacturers, has operated smoothly without any visible signs of discontent. It has tended to check rapid fluctuations and stabilize price levels.

Thus in 1958 there was only one major change and that of small amount, reductions ranging from 1 to 3 per cent. being authorized at the end of the first quarter—the first price cuts to home consumers since January, 1939.

Continuing their practice of keeping prices and costs of production under close and constant scrutiny, the board was moved to authorize a further series of reductions—with certain strings attached. Since the beginning of June last, steel purchased in lots of 10 tons or more has been 2 per cent. cheaper, and the comparisons in Table 8 take this into account.

Again lower costs helped to make this reduction possible, but the board was no doubt influenced by the prospect of more efficient production which could be achieved by what is, in effect, a system of discounts on larger tonnages of steel.

Throughout the depression, consumers continued to run down their stocks and resorted to piece-meal, hand-to-mouth ordering of particular products in small quantities for quick delivery. For the producers this changed pattern of trade was most unsatisfactory. They were deprived of the benefits of mass production and involved in frequent and expensive roll changing.

The response was not immediately apparent. The proffered price cuts were obviously designed as a long-term measure to encourage bulk buying and, taken together with the increased general demand which developed in the autumn, have undoubtedly helped to stimulate buying on a scale which ensures the arrangement of more satisfactory rolling programmes.

In this connection the utterance of Mr. B. Chetwynd Talbot, chairman of the South Durham Steel & Iron group, has attracted considerable attention. It was a carefully guarded statement which appears to suggest that another review of the prices structure may not be far distant. Increased profits are expected to accrue now that the steel plants are working to near capacity limits.

Will the steelmakers be permitted to retain those extra profits to finance the huge capital expenditures on which they have already embarked? Mr. Talbot appears to be in doubt. "Should it appear," he said, "that the ratio as between distribution by way of dividends as compared with the levels of retained profits for the financing of existing schemes and further developments be excessive, corrective measures by the Iron and Steel Board could well be taken."

There the matter rests. Time alone will provide the answer, but the Iron and Steel Board keeps the complexities of steel finance constantly under revision, and although it may be premature to

TABLE 5.—*Weekly Average and Annual Rate of Pig-iron and Steel Production.*

Year.	Pig-iron.		Steel.	
	Weekly average.	Annual rate.	Weekly average.	Annual rate.
1937 ..	163,300	8,493,000	249,700	12,984,000
1951 ..	185,900	9,668,000	300,740	15,638,000
1952 ..	202,400	10,728,000	309,800	16,418,000
1953 ..	214,900	11,175,000	338,600	17,609,000
1954 ..	228,500	11,883,000	355,400	18,520,000
1955 ..	239,800	12,470,000	380,600	19,791,000
1956 ..	253,000	13,014,000	397,300	20,659,000
1957 ..	274,700	14,283,000	417,300	21,699,000
1958 ..	245,000	12,975,000	369,000	19,570,000
1959 ..	242,000	12,582,000	388,000	20,186,000

TABLE 6.—*Producers' Stocks in* 1959.

Month.	Pig-iron.	Scrap.	Steel, all categories.
	Tons.	Tons.	Tons.
January ..	1,619,000	944,000	1,502,000
February ..	1,614,000	953,000	1,483,000
March ..	1,566,000	953,000	1,479,000
April ..	1,507,000	993,000	1,458,000
May	1,512,000	979,000	1,457,000
June ..	1,459,000	948,000	1,425,000
July	1,531,000	1,031,000	1,436,000
August ..	1,511,000	1,032,000	1,498,000
September ..	1,402,000	1,039,000	1,467,000
October ..	1,332,000	1,049,000	1,444,000
November ..	1,261,000	1,019,000	1,410,000
December ..	—	—	—

TABLE 7.—*Consumers' and Merchants' Stocks*, 1957-1959.
(Thousand tons.)

	1957.				1958.				1959.	
	March.	June.	Sept.	Dec.	March.	June.	Sept.	Dec.	March.*	June.*
Consumers' Stocks:										
Sheet	504	447	459	479	484	473	483	440	415	421
Plate	760	791	774	809	836	840	781	712	659	597
Tinplate	121	139	142	136	126	132	124	119	127	125
Total of above products	1,385	1,377	1,375	1,424	1,446	1,445	1,388	1,271	1,201	1,143
Other products ..	2,595	2,623	2,625	2,696	2,774	2,685	2,492	2,299	2,209	2,092
Total all products ..	3,980	4,000	4,000	4,120	4,220	4,130	3,880	3,570	3,410	3,235
Merchants' stocks ..	379	391	386	406	421	432	422	407	387	366
Total consumers' and merchants' stocks ..	4,359	4,391	4,386	4,526	4,641	4,562	4,302	3,977	3,797	3,601

* Provisional figures.

TABLE 8.—*British Home Price Comparisons.*

—	January 1, 1959.	December 31, 1959.
	£ s. d.	£ s. d.
No. 3 foundry iron:		
Delivered Middlesbrough	21 6 0	21 6 0
Delivered Birmingham	20 18 3	20 18 3
Basic iron	20 3 0	20 3 0
Soft billets	32 15 6	31 15 6
Sections	39 16 6	39 16 6
Bars	42 6 6	42 6 6
Plates	42 2 0	42 2 0
Boiler plates	44 12 0	44 12 0
Heavy rails	40 5 0	39 15 0
Black sheets (24 gauge)	58 14 6	57 14 6
Galvanized corrugated sheets (24 gauge)	67 10 0	68 5 0

assume that any price cuts are contemplated, it may be taken as certain that any rises, other than minor adjustments, are out of the question.

Labour Relations

The preservation of harmonious relationships between the iron and steel workers' unions and the employers still ranks as an outstanding achievement of the steel industry. The prolonged period of depression, now happily ended, has exposed this proud record of industrial peace to a severe test.

Earnings have not been reduced. The average pay at the beginning of October reached the peak figure of £14 10s. 6d. per week. But for the greater part of the year many of the men still on the pay roll were only working four or five shifts a week. Yet the workers have exhibited no signs of discontent. On the contrary, they have co-operated with employers in sharing out the work, on the accepted principle that short-time working was better than no work at all.

In a year which has witnessed the alarming spread of "wild cat" strikes, the iron and steel workers have adopted a firm stand against the irresponsibilities which have proved so damaging in many other branches of British industry. They have loyally supported their chosen leaders, and of these none has been more outspoken than Mr. Harry Douglass, general secretary of the Iron and Steel Trades Confederation.

Chosen as one of the members of the TUC committee which is now probing the causes of this multiplicity of unofficial strikes, Mr. Douglass has not hesitated to denounce the sinister influence of the Communists, "at points where the economy of the country can be most seriously injured."

The outcome of the TUC inquiry will not be known for many months, but the workers in the iron and steel industry still pin their faith to the proven merits of peaceful negotiations by which means they have been raised to the status of one of the highest paid classes of organized labour.

Slump in Foundry Work

For the makers of iron castings 1959 has proved to be a year of profound disappointment. Whereas steel is now on the road to recovery, the iron-foundries are still struggling against the winds of adversity.

TABLE 9.—*Iron and Steel Imports and Exports in* 1959.

Month.	Imports. Tons.	Exports. Tons.
Jan.	25,900	222,600
Feb.	30,500	211,300
Mar.	48,200	214,600
April	58,500	242,400
May	57,500	246,800
June	54,400	207,000
July	57,500	292,600
Aug.	46,900	235,200
Sept.	56,600	266,100
Oct.	51,650	356,300
Nov.	74,000	293,200
Dec.	74,300	324,900

To this broad generalization there is one outstanding exception. The establishments catering for the automobile industry achieved a record output, but all other branches of the foundry trade have been in a state of decline.

The Joint Iron Council reports that in the 12 months ended on June 30 last, the total output of iron castings amounted to 3,327,000 tons compared with 3,657,000 tons in the previous year. The 9 per cent. reduction was mainly due to the weakness of the market for pressure pipes, light castings, engineering castings, and ingot moulds.

Some improvement has recently been noted, but it is still very slight and one direct consequence of the depression has been that the consumption of high-phosphorus pig-iron and cast-iron scrap has been on a reduced scale.

The Joint Iron Council estimates that current foundry iron requirements are running at the rate of about 2,500,000 tons per annum, and outputs of the blast furnaces in the Midlands, which handle the bulk of this trade, have had to be reduced.

Foundrymen are now more hopeful that the rising tide of industrial activity will stimulate a better demand for industrial as well as domestic castings and the Joint Iron Council estimates that the current 2,500,000 tons of foundry iron consumption may be raised to 4,000,000 or 4,500,000 tons in the early 1960's.

Oversea Trade

In the pattern of oversea trade the course of the past year has witnessed much more decisive changes. Export prices are not controlled, and

TABLE 10.—*Yearly Totals of Imports and Exports.*

Year.	Imports.	Exports.
	Tons.	Tons.
1938	1,344,600	1,960,100
1945	313,500	657,700
1946	499,500	2,310,400
1947	516,900	1,942,300
1948	567,900	2,090,200
1949	1,252,900	2,475,600
1950	756,900	3,179,500
1951	885,100	2,683,000
1952	2,460,000	2,577,600
1953	1,701,554	2,114,256
1954	764,400	2,408,400
1955	2,318,000	2,726,000
1956	2,123,400	2,824,500
1957	1,284,000	3,303,600
1958	729,996	2,775,563
1959	627,318	3,107,947

TABLE 11.—*Iron-ore Supplies in* 1959.

Month.	Imports.	Home output. Weekly average.
	Tons.	Tons.
Jan.	1,016,400	272,800
Feb.	878,600	276,900
March	886,600	276,100
April	754,300	298,500
May	863,400	292,100
June	1,087,900	285,300
July	1,294,700	275,000
August	1,206,000	253,900
Sept.	1,318,100	288,100
Oct.	1,390,300	298,600
Nov.	1,363,500	299,200
Dec.	1,289,500	
Total, 1950 ..	8,380,687	12,935,800
1951 ..	8,956,000	14,647,100
1952 ..	9,697,600	15,927,600
1953 ..	11,357,000	15,818,400
1954 ..	12,044,000	15,568,400
1955 ..	12,896,500	16,177,200
1956 ..	14,352,200	16,244,800
1957 ..	15,919,200	16,900,000
1958 ..	12,896,000	14,336,000
1959 ..	13,315,200	14,700,000

TABLE 12.—*Scrap Imports in* 1959.

Month.	Tons.	Month.	Tons.
Jan.	200	July	486
Feb.	500	August ..	131
March	—	Sept.	—
April	400	Oct.	49
May	900	Nov.	174
June	200	Dec.	69

during the period of shortage, British steelmakers were able to command substantial export premiums, which in subsequent stress of competition in world markets have since been eliminated.

The gains have probably outweighed the losses. In volume as well as in value, direct exports of iron and steel have increased. The export tonnage for the past year reached a total of 3,107,947 tons, a figure which has only twice previously been exceeded, and as European export prices have risen, the prospects of further expansion of our oversea trade are distinctly bright.

British steel prices are now at a strongly competitive level and the advantage of reasonably cheap supplies promises well for the great steel-using industries whose manufactures bulk so largely in the rising total of our national export trade.

No less impressive is the continued shrinkage of the volume of iron and steel imports. No doubt this decline is due in some measure to the long depression which began in the early spring of 1958 and continued until the end of August last. But a much more decisive factor has been the increase in our own manufacturing capacity. In the manufacture of steel supplies—both semis and finished steel production—we are nearing a state of self-sufficiency.

It appears to be improbable that we shall ever again require to import over 2,000,000 tons of iron and steel of foreign manufacture as we did in 1955, and again in 1956. Imports during the past 12 months reached no more than 627,318 tons, the smallest total for 11 years. The huge shipments of steel semis from Belgium and Luxembourg have been reduced to a mere trickle, and a reinvigoration of British steel capacity encourages the belief that in the years immediately ahead only small marginal tonnages will be needed from external sources.

These changes are invested with important effects not only on the industry, but also on the national economy. With increased home production, bigger exports and reduced imports, British steel is now making a substantial contribution to improvement in the balance of external trade, and this, in fact, may be accounted one of the supreme advantages of the restoration of the industry.

Public Ownership

It may surprise many of our readers to learn that after eight years of Conservative rule, one sixth of UK production is in the hands of the 12 companies still owned by the Government. Moreover, the Iron and Steel Holding and Realization Agency has prior charge securities in a further dozen companies now in private ownership.

Disintanglement has proved to be a slow process. Six years have elapsed since Ishra was first constituted with instructions to accomplish as quickly as possible the return to private ownership of those companies which had previously been nationalized.

The unloading process has proved to be prolonged mainly by the Treasury's rightful insistence that disposals should be conditioned by a financially adequate return on the State properties.

Of the 62 principal companies, 50 have been sold outright, but the rate of disposal has slowed down considerably. Only two small enterprises were transferred in 1958, and one further sale has been made in 1959, again a minor concern with securities of a book value of only £500,000.

Now that the principle of denationalization has been reaffirmed for the third time at a general election, and steel equity valuations on the Stock Exchange have ascended to unprecedented heights, it may be expected that the disposal of Ishra's properties will be speeded up.

By far the biggest of these is the Richard Thomas & Baldwin properties, which were originally transferred to the State in 1950 at a cost of £29,000,000. Resale may be expected to yield a handsome profit, and may not be much longer delayed, but as previously noted, this company has been promised a loan of £70,000,000 to finance the project for a new strip mill to be built at Newport at a probable cost of £100,000,000.

Ishra has also advanced £16,500,000 to the Steel Company of Wales, Limited, and has agreed to provide a further maximum of £23,500,000, and is committed to a loan of £50,000,000 to Colvilles for its new strip mill enterprise.

In short, Ishra still has a very substantial stake in the industry and in a recent publication the Iron and Steel Board calculated that its holdings in its own subsidiaries and in the denationalized companies is now in the region of £240,000,000.

Ore Supplies

Fluctuations in the intake of foreign ore, and, to a lesser extent, home raisings of native ores,

TABLE 13.—*Annual Imports of Scrap.*

Year.	Tons.	Year.	Tons.
1935-39 average ..	743,000	1952	728,000
1946	443,000	1953	862,000
1947	379,000	1954	760,000
1948	858,000	1955	1,271,700
1949	2,097,000	1956	982,230
1950	1,958,000	1957	666,000
1951	589,000	1958	64,142
		1959	2,746

TABLE 14.—*Production of Iron Castings.*

	Year 1957.	Year 1958.	Year 1959.
	Tons.	Tons.	Tons.
First quarter	961,990	961,130	828,100
Second quarter	994,460	887,210	878,500
Third quarter	846,600	742,660	802,180
Fourth quarter	962,050	877,500	—
Total	3,715,100	3,468,520	—

have closely followed the pattern of the market for iron and steel.

In the first half of 1959, arrivals of foreign ore were reduced to the smallest proportions recorded in recent years. It was a matter of sheer necessity. Few works have space at their disposal to accommodate large stocks, and curtailment of imports was unavoidable. In that period less than 5,500,000 tons were imported, and home ore supplies were also slightly reduced.

That phase has now ended. In the second half of 1959 imports increased by about 50 per cent. and consumption matches the rise in the fortunes of the iron and steel trades.

Requirements in the current year promise to exceed all past records and BISC (Ore), Limited, whose responsibility it is to purchase and assess the transport of all oversea supplies, has no doubt made ample provision for prospective needs in the year ahead.

This authority, however, cannot circumscribe its pre-vision to a period of a mere 12 months. Growth of consumption is one of the corrollaries of steel expansion in all the principal steel countries of the world, and the extension of traditional sources of ore supplies and the development of new ore fields proceeds apace.

Of these the most spectacular progress has been made in Labrador and Northern Quebec. Venezuelan deposits are being heavily drawn upon by US steelmakers whose native supplies are inadequate for an ever rising consumption. US interests have increased their investments for developing sources in Brazil, Chile, and Peru.

BISC (Ore), Limited, has not been idle. Developments in Sierra Leone, Guinea and Mauretania have given an impetus to mining enterprises in these areas, and also to the provision of transport and ore-handling facilities.

The tonnage of iron ore of home origin still exceeds the total imports and the revival has provided a new stimulant for the ore mining industry in all areas in this country, particularly in the Oxfordshire, Frodingham and Northamptonshire areas, where the biggest potential supplies have yet to be fully exploited.

The Scrap Trade

For all those who are engaged in the assembly, preparation, and distribution of the millions of tons of ferrous scrap required by Britain's steelworks and foundries, 1959 has been a year of changing experience.

Before the dawn of the year, scrap dealers were plagued by redundancy, none the less embarrassing because it was the first time since the war that supplies exceeded the demand. Recognizing the embarrassment of excessive stocks, the Board of Trade decided in December, 1958, to abandon restrictions upon export and permit shipments under open general licence. It was an opportunity of which traders readily availed themselves, and, in fact, substantial stock reductions were achieved.

Early last March, however, the Board of Trade, probably foreseeing the subsequent recovery of the steel industry, withdrew the open export licence system insofar as it applied to the heavier grades, making an exception which permitted the continued shipment of inferior grades with an f.o.b. value not exceeding £25 per ton. The ultimate time limit was December 6, and since that date, the export ban on all grades of iron and steel scrap has been absolute.

The re-imposition of the ban was not a surprise, nor has the wisdom of the Board of Trade been seriously challenged. If the call for cast-iron scrap from the foundries is still restrained, steelmakers, who are by far the biggest scrap consumers, have increased their requirements enormously and present indications are that the resources of suppliers will be severely taxed to meet the requirements of their customers during the year ahead.

The retention of all home scrap for home consumption is only a first step. Once again suppliers great and small are confronted with the prospect of an intensification of the drive for scrap comparable to days of the National Scrap Campaign.

No help from abroad has been sought; nor is there much likelihood of its being forthcoming, since the needs of Western Europe are just as pressing as our own. Nevertheless, there has been no attempt to exploit scarcity values.

When the embargo on exports was re-imposed early in March last, the British Iron and Steel Federation and the National Federation of Scrap Iron, Steel and Metal Merchants came to an agreement to stabilize prices (which are no longer officially controlled), and also that steelmakers would increase their purchases of home-bought scrap to the extent that with their own arisings, the total intake of scrap would not fall below current consumption.

THE proceedings of the Conference on Modernization of Forges, organized by the British Iron and Steel Research Association in September, 1958, are now available on application to BISRA, 11, Park Lane, London, W.1.

Accidents at Mines in 1959

THE following provisional figures of the number of persons killed and seriously injured in coal, stratified iron, ore shale, and miscellaneous mines during 1959 are issued by the Ministry of Power.

Places or causes of accidents at mines producing coal.	Number of persons killed. Inspection Division. Scottish	Northumberland and Cumberland	Durham	North-Eastern	North-Western	East Midland	West Mid. and Sthn.	South-Western	Total. 1959	1958	Number of persons reportably injured. Inspection Division. Scottish	Northumberland and Cumberland	Durham	North-Eastern	North-Western	East Midland	West M'd. and Sthn.	South-Western	Total. 1959	1958
Underground—																				
Explosions of firedamp or coal dust	—	—	—	10	5	—	—	1	16	—	1	—	—	2	—	—	1	1	5	7
Falls of ground	21	9	14	33	18	11	13	23	142	149	94	58	79	121	60	97	83	118	710	689
Haulage and transport	10	7	2	9	10	5	7	25	75	85	71	31	68	66	36	58	52	100	482	500
Miscellaneous (inc. shaft accidents)	58*	2	2	10	3	5	7	6	93	56	48	11	30	60	24	38	33	61	305	375
Total	89	18	18	62	36	21	27	55	326	290	214	100	177	249	120	193	169	280	1,502	1,571
Surface—																				
All causes	6	1	—	6	3	1	2	3	22	37	21	7	22	31	11	22	21	38	173	181
Total, underground and surface	95	19	18	68	39	22	29	58	348	327	235	107	199	280	131	215	190	318	1,675	1,752

* Includes 47 persons killed in the disaster at Auchengeich Colliery on September 18, 1959.

Place or cause of accident.	Mines of stratified ironstone, oil shale, or fireclay, and miscellaneous mines. Number of persons killed. 1959.	1958.	Number of persons seriously injured. 1959.	1958.	Cause of accident.	Quarries. Number of persons killed. 1959.	1958.	Number of persons seriously injured. 1959.	1958.
Underground									
Explosions of firedamp	—	1	—	1					
Falls of ground	4	9	12	9					
Haulage and transport	—	1	4	2					
Miscellaneous (including shaft accidents)	2	7	9	9	Falls of ground	7	11	12	20
					Blasting	—	3	6	7
					Haulage and transport	10	17	25	31
					Other causes	13	10	50	58
Total	6	18	25	21	Total	30	41	93	116
Surface									
All causes	1	2	3	1					
Total underground and surface	7	20	28	22					

5,000-ton Hydraulic Hobbing Press

RECENTLY completed by the Hydraulic Engineering Company, Limited, Chester, is a 5,000-ton hobbing press for drop forging. The hobbing process, which has long been in use in the plastics industry, has only comparatively recently been adopted by the drop-forging industry, but is now arousing increasing interest as a means of forming relatively simple moulds much more quickly and cheaply than the normal die-sinking process. Dies for producing such things as spanners, small hand tools, rocking levers, and small crankshafts are being made by hobbing.

In the hobbing process, a female die, or mould, is formed from a master male die of special heat-treated steel. The male die is forced very slowly into a blank of normalized steel until the required depth is reached. The mould is then finished by machining, heat treatment, and a final grinding, or polishing operation. The speed of penetration must be as slow as possible to avoid splitting the blank. Speeds as low as 0.01 in./min. can be obtained by pump selection and a flow control valve.

To increase its versatility and utilization, the press is so designed that it can also be used for hot forging, or cold flow forging, at a reduced tonnage and a higher ram speed. The press is capable of loads up to 1,500 tons at 14 in./min., and up to 5,000 tons at up to 0.4 in./min.

The press weighs 73 tons. The frame is made up of eight 3½-in. thick steel plates securely keyed together, and provides for a work table 40 in. square, and 32 in. daylight. The single upstroking ram has a diameter of 48 in. and a stroke of 8 in. Two 60 h.p. 1,440 r.p.m. motors drive the pumps.

C. A. Parsons Activities, 1959

FOR turbo-generator equipment, the most important order received by C. A. Parsons & Company, Limited, Newcastle-on-Tyne, during 1959, was for a 500-MW turbo-generator from the Tennessee Valley Authority of America, to be installed in the Colbert steam plant, Alabama. Other large turbo-generators on order for power stations include four 200-MW and two 300-MW sets for Canada, and a 500-MW set and two 200-MW units for this country. A third 20-MW set has been ordered by the Trinidad and Tobago Electricity Commission to be installed in the Penal power station.

Oversea, machines were completed for Canada, Australia, India, South Africa, Jamaica, and Nigeria. The first 200-MW set to be constructed in this country was put into commission at the Richard L. Hearn generating station of the Hydro-electric Power Commission of Ontario and a second set was also completed during the year. Further machines installed in Canada include the first of two 66-MW sets in the Boundry Dam station, a 20-MW set at Trenton, Nova Scotia, and an 18.75-MW set for the Dominion Steel and Coal Corporation, Seaboard power station. In Australia, the second 60-MW turbo-generator was completed in the Wangi power station (Lake Macquarie) and machines of 30 MW output at Bulimba "B," Tennyson, Bunbury and Melbourne, and the first of two 15-MW sets at Muswellbrook power station, NSW, were completed.

A 30-MW set was put into commission in the Colenso power station, South Africa, and the first of two machines of similar output in the Ijora "B" power station, Nigeria. Other machines of 20-MW and 15-MW output have been completed for India and Jamaica.

COMMISSIONED recently by Chemical Construction (GB), Limited, and Dorr Oliver, Limited, is a plant producing SO_2 gas for sulphuric acid manufacture, using by-product ferrous sulphate, at the Grimsby works of British Titan Products Company, Limited. The plant decomposes dried ferrous sulphate with coal in fluidized bed roasters. It was designed and built by Chemico using Dorr Oliver fluo-solid reactors. The product SO_2 gas is converted to SO_3 for sulphuric acid production in one of the existing converters on the plants supplied by Chemico.

Reinforced V-belts

NOW available from many leading manufacturers, Terylene reinforced premium V-belts, are being used in installations varying from ½-h.p. machines up to 600-h.p. compressors. In most cases they have lasted twice, and, in some cases, five times as long as standard belts. Because Terylene, a product of Imperial Chemical Industries, Limited, is so strong it has often been possible to use fewer individual belts on existing drives, while future drives, designed to incorporate fewer belts, may mean considerable savings in space and money.

The reinforced V-belts stretch far less than standard belts, and it is claimed they also have better dimensional stability, anti-static properties and resistance to heat, oil and shock loading.

Bonnybridge generating station, Falkirk, has been testing Terylene-reinforced V-belts on one of its coal-handling plants, carrying a maximum coal load of 60 ton/hr. Three reinforced belts have lasted twice as long as seven standard belts did previously and in 19 months have needed no adjustment. The Jaguar Car Company has standardized on the reinforced V-belts for all drives in its paint shop. On a 40-h.p. 1,470 r.p.m. turbo-blower at the Trafford Park Works of British Oil & Cake Mills, Terylene-reinforced V-belts have lasted 14 months compared with three to four months for standard belts.

Publications Received

THE following publications which have recently been received are acknowledged with thanks.

FIRTH-VICKERS STAINLESS STEELS, LIMITED, Sheffield —"Enchiridion," 1934-1959. RICHARD THOMAS & BALDWINS, LIMITED, London, W.1—"Ingot News," December. SIMON ENGINEERING (MIDLANDS), LIMITED, Dudley (Worcs)—"SHM News," Christmas. TIMKEN ROLLER BEARING COMPANY, Duston, Northampton—"Timken Times," Vol. 15, No. 11-12. ROUND OAK STEELWORKS, Brierley Hill (Staffs)—"The Acorn," Christmas. SWEDISH CHAMBER OF COMMERCE, London, E.C.3—"Anglo-Swedish Review," December. TEES-SIDE AND SOUTH-WEST DURHAM CHAMBER OF COMMERCE—"Tees-side Journal of Commerce," January. CRAVEN BROS. (MANCHESTER), LIMITED, Stockport—"Machine Tool Gazette," November-December.

British Coal Production in 1959

NCB Division	Saleable output (52 weeks, million tons)			Overall o.m.s. (cwt.)		
	1958.	1959.	Change (per cent.)	1958.	1959.	Change (per cent.)
Scottish	19.47	18.88	−3.0	19.5	20.9	+7.1
Northern (N & C)	13.19	12.81	−2.9	24.6	25.7	+4.5
Durham	24.03	23.48	−2.3	20.6	21.4	+3.5
North-Eastern	42.72	42.24	−1.1	28.3	29.8	+5.4
North-Western	14.96	14.23	−4.9	23.2	24.8	+6.9
East Midlands	45.74	44.88	−1.9	38.4	40.0	+4.3
West Midlands	16.90	15.95	−5.6	25.6	26.7	+4.6
South-Western	22.85	21.19	−7.3	19.4	20.3	+4.6
South-Eastern	1.61	1.61	—	20.2	21.5	+6.0
Total deep-mined	201.47	195.27	−3.1	25.3	26.6	+5.3
Open-cast	14.35	10.83	−24.5			
TOTAL GREAT BRITAIN	215.82	206.10	−4.5			

Notched Alloy Steel Specimen Tests

HIGH-STRESS, LOW-CYCLE FATIGUE PROPERTIES

Relatively little attention appears to have been given to the effects of repeated high stress on severely notched members. The purpose of a paper by S. Yukawa and J. G. McMullin, published in "ASTM Bulletin," October, 1959, is to present data on several types of notched specimens which failed in less than 10,000 load cycles. Several types of specimens and tests were used, each of which had some engineering significance at the time, and some general principles appear to be applicable to the results.

THE material used in the tests was from a large forging, the percentage composition being: C, 0.24; P, 0.026; S, 0.023; Ni, 2.92; Mo, 0.55; V, 0.07. Tensile strength was 44 tons; yield strength, 0.02 per cent., 38 ton/sq. in.; reduction in area, 44 per cent.; impact transition temperature (50 per cent. ductile appearance), 200 deg. F. The types of specimens used are shown in Fig. 1. These are referred to as the small double-notch plate specimen, the large notched plate specimen, and the notched bend bar. The *S-N* curve for the small double-notch plate specimen was first established with zero stress ratio out to 10,000 tension cycles.

Identical specimens were then run at stress levels corresponding to fatigue lives between 500 and 5,000 cycles. Single-cycle overloads of from 10 to 40 per cent. above the cyclic stress were applied to these specimens at various stages of their fatigue life. The specimens were then continued to failure at the original stress level. Tests were made with large notched plate specimens as received and as reheat-treated to a "notch-ductile" condition. The large plate specimens were also tested with zero stress ratio, being loaded eccentrically to simulate the stress distribution in a structural component pertinent to the tests. The bend test specimens were tested in three-point bending with the notched side in tension.

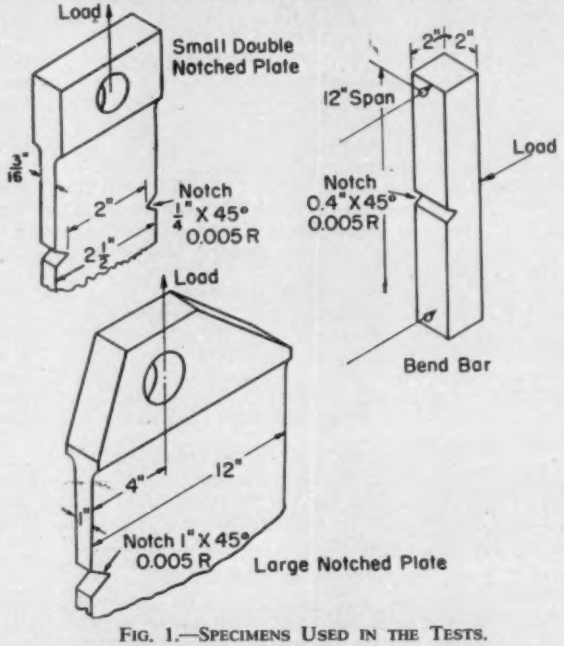


FIG. 1.—SPECIMENS USED IN THE TESTS.

Results of Tests

The 10,000-cycle strength of the small double-notch plate specimen was about 50 per cent. of its static strength. Specimens broken in a single load application exhibited an area of brittle fracture just under the notch, but the balance of the fracture was ductile. In specimens run at lower loads, a characteristic fatigue fracture extended in from both notches to a depth such that the stress on the remaining area approached the static strength at which the specimen failed in a predominantly ductile manner. In most specimens there was still a small area of sudden brittle fracture at the end of the fatigue crack. Overloads of 10 per cent. and 15 per cent. appeared to increase the fatigue life while 20 per cent. and 40 per cent. overloads seemed to have little effect.

In the "notch-brittle" condition the fractures in the large notched plate were all of the cleavage type except for a short length (approx. $\frac{1}{8}$ in.) of characteristic fatigue in those specimens which ran for several hundred cycles. In the "notch-ductile" specimens, the fatigue cracks progressed to a depth of over 1 in. and the specimens failed in a ductile manner. The nominal stress at fracture corrected for fatigue crack depth, but not for stress concentration, was essentially the same in all three ductile specimens. The single-cycle strength of the ductile specimens was beyond the 134-ton capacity of the testing machine.

On the 2-in.-square notched bend-test specimens the fracture proceeded to a depth of 0.2 to 0.8 in. by fatigue and then changed to a typical cleavage-type fracture. The final nominal stress at the

initiation of brittle fracture, corrected for crack depth but not for stress concentration, appeared to increase with test duration.

Conclusions

Analysis of the results disclosed three significant trends. It appears that 10 loading cycles can produce failure at a nominal stress level only 50 per cent. as great as the static strength of a specimen. This relationship seems to apply to all three types of specimens investigated. The final brittle fracture may develop suddenly after very little growth of a fatigue crack. The tests on the large notched plate amply demonstrated this effect. When the same type of specimen was heat-treated to a tough condition (impact transition temperature 80 deg. F.) the fatigue crack progressed to a substantial depth until the stress on the remaining area was sufficient to cause a ductile-type failure. The small double-notched plate specimen did not demonstrate this effect because it was too thin to fracture in a truly brittle manner in tests at room temperature. With bend-test specimens, no tests were run at a high enough stress to initiate brittle fracture in less than 2,000 cycles, during which time a substantial fatigue crack developed. Similar specimens of the same steel which fractured in a few hundred cycles showed little or no fatigue-crack propagation. In the few samples tested, the 10 per cent. and 20 per cent. single overloads during the testing of the thin double-notched specimens tended to increase the fatigue life of these specimens.

Future of Non-ferrous Mining

THE proceedings have recently been published of a symposium held by the Institution of Mining and Metallurgy and the United Kingdom Metal Mining Association held on September 23-24, 1958, at The Federation of British Industries, London, S.W.1.

The object of the symposium was to review the mineralized areas of Great Britain and Ireland and discuss technical and economic problems affecting their exploration and development; to make an appraisal of the potentialities of the non-ferrous mineral industry, and to point the way to its revival.

Some 24 papers were contributed, covering the economic geology of the principal mineralized areas, exploration techniques, the working of existing non-ferrous metal mines, mineral rights, mining taxation, and metal prices. The final session contained a summary of areas of particular interest and recommendations for future action. The original papers and report of discussion make up the present volume of proceedings of the symposium.

The cloth-bound publication, containing 614 pages and many diagrams, plates, and tables, is obtainable from the secretary, Institution of Mining and Metallurgy, 44, Portland Place, London, W.1.

United Kingdom Coal Consumption in 1959

Consumer.	1958. million tons.	1959. million tons.	Change, 1959 compared with 1958. million tons.	Change, 1959 compared with 1956. million tons.
Coke ovens ..	27.8	25.7	− 2.1	− 3.6
Gas	24.8	22.5	− 2.3	− 5.3
Electricity ..	46.2	46.1	− 0.1	+ 0.5
Railways (including briquettes)	11.3	10.2	− 1.1	− 2.6
Iron and steel ..	4.5	4.0	− 0.5	− 2.1
Engineering ..	3.0	2.7	− 0.3	− 0.8
Other industry ..	26.1	24.8	− 1.3	− 5.1
House	29.4	27.1	− 2.3	− 3.5
Other inland ..	18.0	17.0	− 1.0	− 2.7
Miners' coal and colliery consumption ..	11.7	10.4	− 1.3	− 2.7
Containing total inland consumption ..	202.8	190.5	−12.3	−27.9

Macro-etchant for High-alloy Steels

A SIMPLY made macro-etchant for certain nickel-base, high-temperature, high-alloy steels is referred to in an article published in "Steel," October 12, 1959. It is particularly useful with three types of material mentioned, the percentage compositions of which are appended.

Waspaloy: C 0.05; Cr 19.50; Co 13.50; Mo 4.00; Ti 3.00; Al 1.25; Zr 0.06; B 0.005; Fe 2.00; Ni balance.

Rene 41: C 0.09; Cr 19.00; Co 11.00; Mo 10.00; Ti 3.10; Al 1.50; B 0.005; Ni balance.

M-252: C 0.10; Mn 1.00; Si 0.70; Cr 19.00; Ni 54.00; Co 10.00; Mo 10.00; Ti 2.50; Al 0.75; B 0.005; Fe 2.00.

Mr. S. M. Purdy, supervisor of metallurgy for the Carpenter Steel Company, Reading, Pa., states that the etchant is prepared by mixing one part saturated copper-sulphate solution with two parts of concentrated hydrochloric acid and heating the mixture to between 160 and 170 deg. F. for use. The best way to use it is to cover the sample with about ½ in. of the mixture. After about half an hour, the specimen should be examined, without removing it from the solution, the greenish acid remaining clear and not interfering with inspection.

When the desired structure is developed, the sample is removed, rinsed in water, and dried in an air blast. Examination of the specimen may reveal the etching to be insufficiently deep: if so, it is merely re-immersed. The solution, it is stated, does not show any evidence of deterioration after standing for a week, nor after processing additional samples.

Surface preparation, while important, is not critical, although the ideal starting material is a ground surface. The surface resulting from cutting the sample with an abrasive wheel is usually suitable, unless "burning" is apparent. In general, however, ground surfaces are preferred to machined.

THE Editor of IRON AND COAL acknowledges with thanks the receipt of an illustrated wall calendar from Fafnir Bearing Company, Limited, Wolverhampton.

FLEXIBILITY IN COAL MINING

Presidential Address to the Institution of Mining Engineers

IN his presidential address to the Institution of Mining Engineers in London yesterday (Thursday), Mr. R. G. BAKER examined the coal-mining industry's failure to match output with demand. The industry, he said, had become rather set in its ways and outlook, largely as the result of a lack of flexibility made manifest by the inability to raise output as rapidly as required.

There were a number of reasons why an output buoyancy could not be had, and one of them was that, unlike manufacturing industry, the NCB could not just build new pits like new factories on some site favourable as to situation and labour supply. It had to content itself almost exclusively with the upgrading and uprating in capacity of existing collieries, and had to accept the local labour availability, however poor it might be.

If home demand were considered as a convenient index, it was worth noting that the 25,000,000 tons rise in consumption for the eight years 1948-1956 had been wiped out in the last 2½ years. The industry, within living memory, had had to face a similar rate of falling home demand of a similar duration, in the years 1930, 1931, and 1932. In those years industrial activity was depressed on a wide front throughout the country. A recovery in coal mining depended on a revival in industry at large. The industry was by no means alone in having unemployment and short-time working. A significant difference between today and the 1930's was that then the industry found the necessary flexibility to deal with a falling demand mainly out of short-time working and unemployment. Coal stocking was used only to a very limited extent and it was doubtful whether stocking to any material degree could have been financed.

Adjusting for Demand

If short-time working was to be avoided, it meant that, in a falling market, flexibility was reduced and largely limited to that which could be had from natural wastage in the numbers of men employed. Consideration, however, must not be limited solely to a declining market. That would be a new one-track outlook; the industry must be ready for a cessation of and even reversal in the downward trend.

If variations in manpower, and consequently variations in output, were to be produced by control of recruitment alone, there was bound to be a limiting rate at which any change could be brought about. That limiting rate would vary from place to place and from time to time, according to the availability and relative attractions of other employment.

Once restriction of recruitment was put into operation its effects were unlikely to be checked and reversed immediately recruitment policy changed.

Stocking or unstocking of coal could help to bridge the difference between supply and demand, but, like the storage of anything else, it had its limits. The difficulty with coal stocking was that its limits of capacity were not readily discernible or absolute. However, limits there must be arising out of both physical and financial considerations. The permissible rate of stocking at any time must be largely governed by the amount of stock currently held compared with overall stocking capacity. Clearly then, flexibility derived from coal stocking was not a fixed factor; it was only transient and, in particular, it could be exhausted completely.

Varying Recruitment

Recent experience had shown how far stocking could go when a change in demand was not followed fairly promptly by a change in supply. If we were to try to avoid excessive stocking and also harsher measures than restriction of recruitment as a means of giving the flexibility to enable supply to follow a falling demand, and if we were to have any chance of meeting a rising demand by full recruitment before flexibility from stocking was exhausted, we must accept the consequences of control of recruitment being a delayed-action measure with limited and unpredictable rates of operation. That, in Mr. Baker's view, meant that the rate of recruitment should be varied to follow a change in demand as soon as a new trend became discernable.

It was so easy to be wise after the event. It would be so easy to point out that the present supply and demand would have been much more closely matched and stocks would have been lower if restriction of recruitment had started in, say, mid-1957 instead of early 1958. In retrospect, it was arguable that a downward trend in demand was discernable in mid-1957. Discernable it may have been, but it was doubtful whether it would have been possible to convince anyone that it was more than a quite temporary phase, and, of course, the general trade recession did much to mask the true situation.

The National Coal Board was doing much to stimulate demand. However, it was not sufficient to advertise, to call on people and build up personal sales contacts, or to offer technical advice or service. These were essential preludes to conditioning a customer, but permanent business could only be had by giving the customer what he wanted.

Competition was not new; in the 1930's there was keen competition between units within the industry. Coal was mined and prepared with the utmost care, for the reason that, from the highest official to the most junior mineworker, everyone knew that coal

which was not to a customer's liking would not sell and coal which would not sell would not be mined; and, in turn, if coal was not mined men did not work. The circumstances were indeed compelling, but they were, in fact, just as compelling now, although stocking of coal for which there was no immediate market had tended to obscure the issue.

Mining engineers should have a big interest and a big part to play in the saleability and the actual destination of their coal. That should be recognized and their interest must be encouraged and completely re-established so that they, in turn, would stimulate the interest and concern of all people at the collieries.

Production of coal suitable for a particular purpose with a satisfactory degree of consistency might not be easy of achievement, and success or failure was tied up very much with the mining situation at individual collieries. Coal *in situ* was far from being a homogeneous material; it varied from band to band within a seam; it might be interspersed with dirt bands, and seams varied within the confines of a single pit. Where two seams having differing characteristics were worked in a pit, the choice might lie between winding and preparing them separately, with a fair chance of producing consistent saleable products, or winding and preparing them mixed, giving a product lacking in uniformity.

The actual working of a seam could have considerable bearing on the properties of the product. For instance: should a seam be cut at the horizon which was best for the easy working of the seam, or should a cut be made at some less preferable horizon to remove an unwanted band of dirt or inferior coal? Indeed, should an extra cut be made to remove some particularly troublesome material? Should faces be worked on bord or end? Should gummings be filled out as run-of-mine coal, filled separately or gobbed? Should certain seams be worked at all? What should be the balance of output from those seams which were worked? What power-loading machines should be used? And so on.

In the end, the mining engineer had to decide what was possible and what the result might be; but since the outcome was almost bound to be a compromise based on judgment, it followed that the best answer would not be forthcoming unless it was based on a balanced knowledge of all the factors.

Coal Processing

Coal was not a factory product; it was not susceptible to redesign and retooling. Most of some 10 well-known properties of coal, namely, size, calorific value, content of volatiles, moisture, ash, sulphur, phosphorus, chlorine, coking properties, and ash fusion, were inherent in the coal seam, but by mining methods, by seam selection and by subsequent cleaning processes, the means were available whereby some variation of the properties of coal as supplied to the customer could be achieved. Mr. Baker emphasized, however, that subsequent cleaning processes could not do everything.

Turning to coal processing, he said that this was not a new subject, although the only process widely used was that of carbonization, with complete gasification at present trailing along far behind so far as tonnage was concerned. That was not really surprising since the processing of coal by other means, such as hydrogenation, had been found to be either difficult or commercially unattractive and, in particular, coal had been fully sold for almost the last 20 years.

It was, perhaps, worth taking note of the fact that the proportion of coal carbonization which was carried out by the coal-mining industry itself had steadily decreased over the years.

Integration of complementary activities had also gone on to a great extent in the majority of unnationalized big businesses. However, coal nationalization, in some cases, resulted in a move in the opposite direction, inasmuch as it severed collieries from some of the coke ovens and all of the steelworks which had previously been under common ownership.

On the Continent a relationship between steel and coal still existed and, in addition, collieries were often quite substantial generators of electricity for outside consumption, in this way consuming their own washery middlings and slurries.

Mr. Baker pointed that he was not advocating that the Coal Board should go in for such activities as the manufacture of engineering products on a big scale, but he submitted that coal processing, either by carbonization or by other treatment, was properly complementary to coal mining and that the coal-mining industry must see that it had a full share in any new developments.

Chemical Possibilities of Coal

The National Coal Board had been working for a long time on coal processing towards a high-density smokeless fuel. It was a difficult problem, but smokeless fuel was obviously the first choice since the Clean Air Act, 1956, which was so detrimental to the domestic coal market, had created a ready market for a solid smokeless fuel. However, the margin between the price of the raw material and the proceeds from the finished product left little enough to meet the cost of processing. It would be nice if they could aspire to a margin to cover processing and retailing.

There was too much easy talk about the use of coal as a basis for chemical manufacture. It was true that a multitude of important and costly chemicals were derived from the products of coal distillation, and others could no doubt be derived without primary distillation as a preliminary step. However, the market for such products must be limited and could not be very significant in terms of tonnage when compared with the output of coal which the industry could make available for processing.

The outlook for conversion of coal to heavy fuel oil was at present poor on account of insufficient price margin between the two fuels, to meet processing costs, although coal used as a fuel had a good margin. On the other hand, the price

margin with other liquid fuels was much better. Bearing in mind that there was an ever growing demand for liquid fuels for petrol, diesel, and jet engines, it appeared that this was a direction in which research might be directed. Moreover, if such fuels could be produced from coal they would have the secondary effect of reducing the amount of the heavy fuel oil which was produced as a by-product of these higher grade liquid fuels.

Referring to the proposed increased generation of electricity by the Central Electricity Generating Board from coal-fired stations, Mr. Baker said this was good news, but, of course, this "processing" would not be in the hands of the coal-mining industry. In a general way perhaps it did not matter so much, but if they were going to prepare coals with a reliable low ash content for processing to premium fuels or as a raw material for chemical manufacture and if, at the same time, the discard was to have an acceptably low content of combustible, it seemed inevitable that a middling must be extracted and that the unavoidable irregularities in the raw coal feed to the washery would be reflected and even concentrated in the middling fraction. Would a high ash, high moisture fuel stand transport costs? Would the CEGB take this inconsistent fuel happily? And if not, would it be better for the coal-mining industry itself to convert it to electricity? That might not be of major importance against the total background of coal processing, but Continental practice showed it to be a most useful adjunct to coal preparation.

Selective Mining

Turning back to more purely mining considerations, Mr. Baker said it might be worth giving some thought to whether they could do anything in the planning, equipping and working of collieries to give a greater inherent flexibility. It seemed doubtful whether there was anything to be done in this direction which would have a significant bearing on the actual rate of production, but underground considerations could have a bearing on the sort of coal produced. They had got to think very seriously whether mining layout and equipment could any longer be such that, where two or more seams of differing characteristics were being mined, the coal was inevitably either wound or prepared as a mixture. Such a mixture might be tolerable under one set of market conditions and yet unacceptable at other times.

The advantages of easy multi-level winding obtainable with the single cage and balance-weight should not be overlooked. Block winding might be the answer and, even if this was not currently required, pit-bottom layouts should be such that sufficient standage for block winding could be had at a later date, although, of course, the necessary drivages for this standage need not be made until required. The same considerations would have some bearing on whether trunk conveying of coal from more than one seam to the pit bottom should be used.

The marginally-acceptable seam also required special consideration. The seam might be marginally acceptable because of the nature of the coal itself or it might be because it was not being worked economically. It should be recognized that the working of such seams might stop and after a few years restart. Fortunately, most underground equipment was of a portable or semi-portable character, so that its recovery without loss, other than the cost of removal, was relatively easy; thus there was no case for a marginal seam being equipped in a sub-standard fashion, nor would there be any justification for lowering the standards of roadways, since the size of a roadway in the ultimate was usually determined by the quantity of ventilation which it had to pass.

However, the provision of a costly pit bottom, to achieve the maximum economy in labour which could be justified for a long-life quality seam, would be a less certain proposition in the marginal seam where a less expensive layout, though somewhat more extravagant in labour, might be the more rational investment. With regard to the layout of working faces, it would seem desirable to achieve the maximum concentration of working in an area.

Apart from the ordinary objective of economy in transport during current working, there would be the two-fold objective in the event of the temporary abandonment of the seam. Firstly, there would be the minimum length of main roadways subject to deterioration and, secondly, more of the coal remaining to be worked would lie in areas unspoiled by abandoned workings.

The ability to adopt fast moving power-loaded longwall faces more widely, even though not generally applied, would provide a most valuable tool for achieving flexibility in output as between seams. It would, of course, also help to keep the area of working highly concentrated in a marginal seam.

Flexibility of Output

Mobility of manpower, which was a valuable asset at any time, was absolutely imperative if there was to be any flexibility in the working of the collieries. Mobility within a single colliery should present no special difficulty and movement of employees between pits in neighbouring localities, while offending man's inherent resistance to being disturbed from that which he had chosen for himself, did not create any serious social hardship. However, mobility over a wider range did react on a man's social life in a significant manner. The greater the social disturbance the more reluctant was one to see men so disturbed, but there was no escape from the fact that mobility of manpower was the only alternative to short-time working and/or unemployment.

It was no good contemplating flexibility of output underground without considering whether the coal preparation plant had an equivalent flexibility. It was unfortunately far too expensive, when putting down a coal washery, to provide for all the variations which might be called for over a period of years. Experience of the past showed that, either for changing-market reasons or change in the nature of the feed to the washery, modifications were called for within a comparatively few years, said

Mr. Baker. Washeries should, if possible, be placed a little away from other buildings and steel-framed buildings should be looked upon more favourably.

The present coal-mining run-down, which had been most carefully planned and controlled, had come in for a certain amount of criticism. It was no time at all since both coal miners and coal were in short supply in this country. Mr. Baker asked whether those advocating a more rapid and drastic run-down in the coal-mining industry to the point where coal stocks would clear themselves quickly, realized that the impetus of run-down might get out of hand and that coal shortage might well return to this country.

The industry, he concluded, must not get the "run-down" objective out of perspective. It must move with some speed towards a balance between output and demand, with progressive stock reduction; but with the existing limited flexibility, over-speeding would be quite dangerous.

Technical Survey of Dorman Long (Steel), Limited

COMPLETION of its £60,000,000 post-war development programme with plant developments covering all stages of production from the receipt and treatment of raw materials to the manufacture of a considerable range of steel products and by-products, has recently been reached by Dorman Long (Steel), Limited.

To commemorate the achievements of this programme, IRON AND COAL TRADES REVIEW has published "A Technical Survey of Dorman Long (Steel), Limited," the seventh in its series of technical surveys of the achievements of British steel companies.

In the 210 fully illustrated pages of this latest survey are described the plant, practice, and performance of the many installations developed by the Dorman Long group. They include: Cleveland ironstone mining; ironmaking; steelmaking; rolling mills—the Universal beam mill and heavy structural mill, and the merchant rod and strip mill at Lackenby, plate mills at the Redcar Works, rail mill and section mills at Cleveland Works, semi-mill at Acklam Works, and section mills at Britannia Works—and coke ovens and by-products plant at South Bank. Details are given of fuel and power generation, engineering maintenance and services, design and construction of buildings, layout and organization of transport, structural engineering, and education and training.

Sir Ellis Hunter, chairman and managing director of Dorman Long & Company, Limited, contributes a foreword to the survey, which is introduced by Mr. E. T. Judge, joint managing director of Dorman Long (Steel), Limited. The survey is prefaced by a brief history of the company.

Copies of "A Technical Survey of Dorman Long (Steel), Limited," are obtainable from the Publisher, John Adam House, 17/19, John Adam Street, Adelphi, London, W.C.2 (price 15s.; by post, 16s. 9d.).

FORTHCOMING EVENTS

FEBRUARY 1

North Staffordshire Institute of Mining Engineers: Meeting at the North Staffordshire Technical College, at 5.30 p.m.: "Coal Ploughability," by C. M. Harmer.

FEBRUARY 4

Midland Institute of Mining Engineers: Meeting at the Danum Hotel, Doncaster: "Measurement of Strain in Concrete Shaft and Roadway Linings," by R. Shepherd and A. H. Wilson.

FEBRUARY 6

North of England Institute of Mining and Mechanical Engineers: Meeting in the institute lecture theatre, Neville Hall, Newcastle-upon-Tyne, at 2.30 p.m.: "Prop-load Measurements Underground," by J. D. Jenkins and I. Storey, and adjourned discussion on "Layering of Firedamp in Longwall Workings," by E. J. Raine.

FEBRUARY 8

Lincolnshire Iron and Steel Institute: Meeting at the North Lindsey Technical College, Scunthorpe, at 7.30 p.m.: "Special Steel Production," by F. C. Martin.

FEBRUARY 10

North Wales Metallurgical Society: Meeting in the lecture theatre, Flintshire Technical College, Connah's Quay, nr. Chester, at 7 p.m.: "Prospects for the Continuous Casting of Tonnage Steel," by J. Savage.

Institute of Metals: Meeting at the institute headquarters, 17, Belgrave Square, London, S.W.1: "Solidification of Alloys," by W. C. Winegard.

Institution of Plant Engineers (Dundee Branch): Meeting at Taypark Hotel, West Ferry, at 7.30 p.m.: "Uses of Aluminium in Engineering.

FEBRUARY 11

Combustion Engineering Association: Meeting at St. Ermin's Hotel, London, S.W.1, at 10.30 a.m.: "Work of the British Coal Utilization Association Towards Improving Mechanization and Automatic Control in Industrial Coal-fired Boiler Houses," by G. G. Thurlow.

Institution of Mechanical Engineers (East Midlands Branch): Meeting at the Technical College, Chesterfield, at 7.15 p.m.: "Future Trends in Coal-mining Machinery," by J. R. Ashley.

Manchester Geological and Mining Society: Meeting at the Wigan and District Mining and Technical College, at 4 p.m.: "Experiments with Roadway Supports," by J. G. Hind.

Society of Chemical Industry (Corrosion Group): Joint meeting with the Liverpool Section, Liverpool Metallurgical Society, and College Scientific Society, at the College of Technology, Byrom Street, Liverpool, at 7.30 p.m.: "Recent Research on the Corrosion and Protection of Iron and Steel," by J. C. Hudson.

FEBRUARY 12

Normanton, Castleford and District Mining Society: Meeting at the Whitwood Technical College, Castleford, at 7 p.m.: "Manpower Saving Devices," by S. C. Walker.

Southern Counties Institute of Mining Engineers: Meeting at the headquarters of the Institution of Mining Engineers, London, S.W.1: "Contributions of Metallurgy to the Coal-mining Industry," by A. Latin.

Manchester Association of Engineers: Meeting at the Engineers' Club, Albert Square, at 6.45 p.m.: "Future of Coal Preparation," by J. E. Chick.

FEBRUARY 18

Institution of Plant Engineers (Blackburn Branch): Meeting at the Castle Hotel, at 7.30 p.m.: "Some Experiences with Chemical Engineering Plant," by J. C. Veale.

National Association of Colliery Managers

FEBRUARY 1

South Midland Branch: Meeting at the Rescue Station, Ashby-de-la-Zouch, at 4 p.m.: "Mechanization—Taking Stock," by R. Lansdowne.

FEBRUARY 9

Yorkshire Branch: Meeting at the Miners' Welfare Hall, Brodsworth, at 3 p.m.: "Solid Stowing on a Mechanized Face at Wharncliffe Silkstone Colliery," by E. E. Crankshaw.

FEBRUARY 15

Midland Branch: Meeting at the Denman's Head, Sutton-in-Ashfield. Paper by N. Siddall.

FEBRUARY 24

Lancashire Branch: Meeting at the offices of the North-Western Divisional Board, Manchester, at 4 p.m.: "Recent Experiences of Caving in the St. Helens Area," by J. Abbott.

FEBRUARY 26

Kent Branch: Meeting at the Swan Hotel, Deal, at 7.15 p.m.: "Some Recent Developments in Underground Mechanization," by A. G. Douthwaite.

Driving Underground Roadways

PROTOTYPE MACHINE FOR MECHANIZED RIPPING

THE Central Engineering Establishment of the National Coal Board has recently produced and tested a machine which may have far-reaching effects on the driving of underground roadways. It was based on an idea put forward by Mr. C. V. Peake, Area production manager of No. 5 (Ilkeston) Area of the East Midlands Division.

It is an experimental machine designed to investigate the principle of cutting out roadways behind the coal face by means of cutter picks, and then to assess the magnitude of the dust suppression, dirt disposal, and strata control problems which would arise from such an operation. The ultimate aim of the development is to produce a machine which will relieve the ripping problems set up behind highly mechanized faces where advances of the order of 9 to 10 ft. in a shift make very difficult the task of disposing of the debris in the time available.

Further development of the present test rig, it is envisaged, will lead to a machine which would take slices off the ripping lip, producing a manageable quantity of debris each time, and that this debris would then be carried or thrown into the pack-holes on either side of the machine; such a machine would enable ripping to take place in a loader gate at the same time as coal coming off the face and would increase the productivity of the ripping operation by up to 25 per cent.

Arrangement of the Rig

The general arrangement of the rig is shown in Fig. 1. It consists essentially of a swinging arm pivoted at a point in the centre of the roadway, and carrying two small cutting drums, each similar to an Anderton shearer drum but only 2 ft. in dia. One of these drums is at the outer extremity of the arm and the other is closer to the centre, and the arm is swung about its pivot point by means of a chain carried on rollers attached to an arched frame. In operation, the arm is lowered to one side so that the cutting heads are at floor level, then the whole rig is pushed forward until the cutters are beneath the ripping lip. As the arm is swung up with the cutters rotating, a slice is cut off the lip; with the present machine this cut is 1 ft. deep, so that the roadway is advanced in steps of 1 ft.

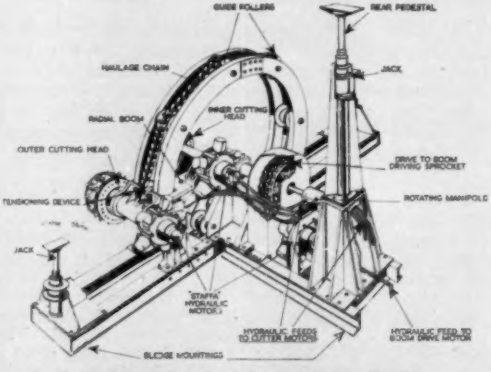


FIG. 1.—TEST RIG FOR MECHANIZED RIPPING.

The machine (Figs. 2, 3, and 4) is not yet self-advancing, nor has provision been made for removing the debris, since it was felt that the machine should merely be a test rig to investigate the cutting principle at this stage and that further complication was undesirable. The rig is hydraulically powered, each of the cutter drums being directly driven by

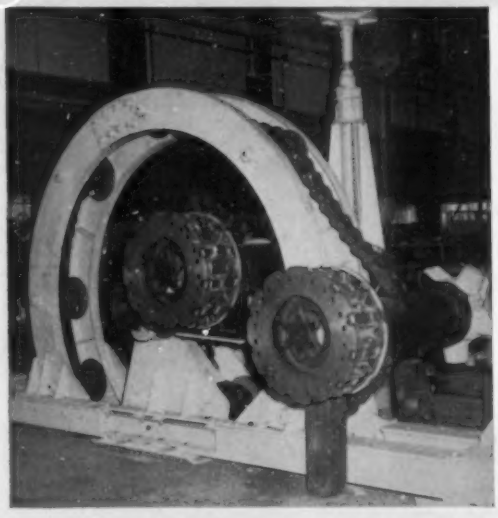


FIG. 2.—EXPERIMENTAL RIPPING MACHINE.

a five-cylinder "Staffa" motor, while another similar motor drives the boom haulage chain. The power comes from a separate hydraulic power pack containing a single variable delivery pump working at 2,000 lb./sq. in., and driven by a flameproof electric motor.

Hydraulic power was chosen for this application because of the need to vary the speeds of the motors for test purposes. On a production model electric motor drive will probably be used. The rig is mounted on a T-shaped base-plate which is held in position by three individually hand-operated

hydraulic jacks pressing up against the seam and roadway roofs.

To date, tungsten-carbide tipped cutter picks of fairly conventional type have been used, and found to give a satisfactory performance. Experiments with various shapes of pick point are being undertaken and some interesting comparisons of cutting speed and power requirements are being made. The picks are held in the drum by a wedge system devised at CEE in which one bolt tightens a complete row of picks.

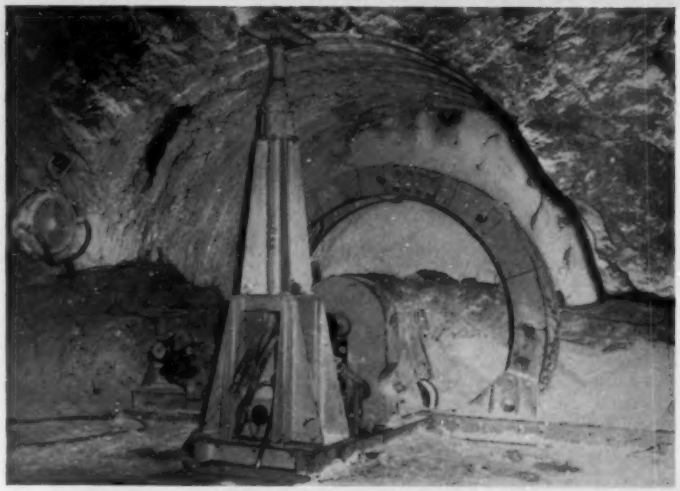


FIG. 3.—EXPERIMENTAL RIPPING MACHINE AT TEST SITE —GYPSUM MINE.

Test Results

Tests are still in progress, but some of the principal observations to date are appended:

Cutter Pick Wear.—Pick wear in gypsum was negligible. In shale it was not expected that pick life would compare with that in coal, but results so far have been very encouraging. At Coppice Colliery the roadway was advanced a distance of 13 ft. before the picks needed re-sharpening. More robust designs of pick are at present being tested.

Chain Tension.—A strain gauge fitted to the boom haulage chain showed the cutting tension to be a good deal less than had been expected. The maximum figure obtained was in the region of 4 tons and the average was 2 tons.

FIG. 4.—VIEW OF CUTTING HEAD OF EXPERIMENTAL RIPPING MACHINE.

Power.—The power requirement of each cutter has varied according to the rate of cutting and the feed, and the configuration of the ripping face, but 25-30 h.p. per drum is considered adequate for the purpose.

Rate of Cutting.—Pick speeds of the order of 200 ft./min. have been used to take a 1-ft. deep cut off a 12-ft. by 5-ft. ripping lip in 12 min.

Dust Suppression.—Water sprays fitted to the rig have reduced the dust to some extent, but more work on this problem remains to be done before approved conditions can be obtained on the return side of the machine.

Future Development

The results of the underground experiments with the test rig have been very encouraging and have led to some mining machinery manufacturers undertaking to investigate the design of a production machine.

Problems still exist in disposing of the debris, advancing the machine, suppressing the dust produced, and supporting the roof over the machine, but attempts are already being made to overcome them in an improved design. This project is a promising attempt to solve the ripping problems brought about by intensive face mechanization.

Revised BS on Twist Drill Lengths

A revised British Standard for the general dimensions of twist drills (BS 328: Part I 1959) is designed to provide a more efficient twist drill, able more easily to accommodate the high torques and thrusts associated with modern drilling practice; furthermore, the possibilities of drill "wander" are reduced. The more systematic diameter to flute length ratio gives a more consistent performance relationship between drills in adjacent length groups than hitherto.

Borated Graphite for Dounreay

STARTING-UP recently of the fast breeder reactor at Dounreay in the North of Scotland focuses attention on the activities of the Morgan Crucible Company, Limited, Battersea, who it is now revealed supplied the special borated graphite blocks used for the first time by the United Kingdom Atomic Energy Authority in the assembly of the shield which surrounds the reactor at the Dounreay experimental station. The blocks were made and machined at the Morgan Crucible Company's works at Norton, near Worcester. This factory is not engaged in the production of nuclear pure material and was therefore chosen as one suitable for handling large quantities of boron compounds.

The purpose of the borated graphite is to slow down fast neutrons and then absorb them in the shortest possible distance, thus providing a safety screen. Most of the borated graphite contained 0.3 per cent. boron, but some contained 5 per cent.—in both cases uniformly distributed throughout the graphite. The blocks themselves were machined to 500 different patterns. Some of the patterns were so intricate that wooden dummies had first to be made to ensure that it was practicable to machine them in graphite. As a final check, the layers of finished graphite blocks were assembled at Norton into their complicated form of eccentric circles.

The blocks, painted with distinguishing coloured bands to avoid any risk of confusion with nuclear pure material, were then packed into cartons for the journey. Transport to Dounreay was by heavy lorry which made one round trip of 1,500 miles per week, taking eight months in all.

Handling and Treatment of Iron Ores

HANDLING and treatment of iron ores are the subjects of a special report No. 65 issued by the Iron and Steel Institute. During his period of office as president of the institute, Mr. A. H. Ingen-Housz (President of the Royal Netherlands Blast Furnaces & Steelworks, Limited), invited the Iron and Steel Engineers' Group to hold a meeting in the Netherlands as guests of his company. This invitation was accepted, and the meeting was held from Tuesday to Friday, April 14 to 17, 1959, it being attended by about 150 members. The programme consisted of technical sessions in Amsterdam and visits to the works of the Royal Netherlands Blast Furnaces & Steelworks, Limited, at IJmuiden, to the Rotterdam Dry Dock Company, Limited, and to the ore-handling installation of the Muller-Hanna Company, Limited, at Rotterdam.

The present report includes the following papers: "The General World Iron-ore Situation," by C. R. Wheeler; "The Muller-Hanna ore-handling installation at the port of Rotterdam," by Fred D. Vines; "Ore-transfer facilities at Contrecoeur, Quebec," by D. H. Sharp; "Ore-handling facilities at Seven Islands, Quebec," by D. H. Sharp; "Transportation and handling of iron ores in Great Britain," by T. V. Nicholson; "The unloading of iron-ore ships in the US and Canada," by H. R. Mills, and discussions on a number of other relevant papers.

Test Unit for Gate-end Boxes

A UNIT for testing, or locating faults in Baldwin & Francis-type Semlo gate-end boxes has been devised by Mr. J. J. BATES, of the National Coal Board's North-Western Division. The object of the unit is to reduce the complexity of the routine tests on gate-end boxes, and the time taken in carrying out these tests.

The unit consists of a set of test circuits connected to a suitable testing instrument and mounted in a modified version of the control-unit frame housing normally supplied with the boxes. The test circuit contains a selector switch, and terminals are provided to which the test leads of the instrument can be connected.

When routine tests or fault finding are to be carried out, the unit is plugged into the box in place of the control unit, and by use of the selector switch the whole of the interior, broken down into simple circuits, can be tested in about 10 min. The plug-in connections of the unit, with positive connections to the testing instrument, ensure that true readings are obtained and so eliminate the trouble of test prods. The selector switch ensures a definite sequence of tests, and no parts can be missed.

Liquid Fuel from Coal

RESEARCH during the period 1944-55, on the production of synthetic liquid fuels from coal is described in a recent publication by the US Bureau of Mines. Entitled "The Bureau of Mines Synthetic Liquid Fuels Programme, 1944-55. Part I.—Oil From Coal" Report of Investigations 5506, summarizes the bureau's work on preparing synthetic fuels from coal. This information had previously been available in detail in more than 700 reports, patents, and technical publications.

It is believed that the information collected during the 11-year period will become more valuable if the depletion of petroleum reserves makes it economic to supplement the supply of gasoline and other liquid fuels with products made from the relatively extensive reserves of coal and oil shale. Meanwhile, the Bureau of Mines is continuing laboratory and pilot-plant research on production of synthetic fuels from coal and oil shale, to improve older processes and to seek new and more efficient ones.

New Catalogues, etc.

THE following new catalogues, booklets, etc., have been received and are acknowledged with thanks.

ENGLISH STEEL CASTINGS CORPORATION, Sheffield, 9—Booklet describing the company's range of Willison automatic couplers.

SOUTHERN METALIFE, LIMITED, Harrogate (Yorks)—Leaflet giving details of Metalife liquid metal anodic unit for protection against corrosion.

ENGLISH ELECTRIC COMPANY, LIMITED, Stafford—Booklet Nos. ST/122, MR/111, GT/103, DE/217, PS/133, DM/257, with details of steam turbines; marine steam turbines; gas turbines; diesel engines; induction motors; high-slip, and high-torque motors, respectively.

Fuel Technology in Canada

ALTHOUGH coal is the most abundant of Canada's reserves of fossil fuels and is comparatively cheap at the sources of production, the cost of transport and distribution makes Canadian coal vulnerable to the competition of oil and gas and even of US coal in Ontario and Quebec, states A. Ignatieff, Chief of Fuels Division, Department of Mines, Ottawa, Canada, in a paper on "Fuel Technology in Canada" presented to the Institute of Fuel.

In the foreseeable future coal, the author considers, will continue to play an important role in the generation of electric power, as indicated by the very large coal-fired steam plants in Ontario and the plans for expansion. Plants at Toronto and Windsor, fuelled by coal cheaply transported by water from United States ports, have generating capacities of 800 and 264 MW respectively and additions in 1960 and 1961 will bring the Toronto plant alone to capacity of 1,200 MW. Two further plants are planned for 1961 at Long Branch and Fort William with 300 and 100 MW capacity respectively, with an additional 300 MW planned at Long Branch plant for 1962.

Lignite, which can be regarded as the cheapest fossil fuel at source, contributes to the generation of electricity in Manitoba and Saskatchewan. Recently a new plant of 132 MW generating capacity has been erected at Boundary Dam, Estevan area, in the centre of the largest lignite field.

Energy Consumption in 1980

The Royal Commission on Canada's Economic Prospects (Gordon Commission) in 1957 in its separate study of energy prospects visualized that in 1980 the total Canadian energy consumption would be approximately the equivalent of 300,000,000 tons of coal and would be derived, expressed as percentages, from the various fuels thus: Coal, 16; petroleum, 45; natural gas, 25; wood, 1; water power, 11; nuclear energy, 2. These figures forecast at least a doubling of the present coal consumption.

Consumption of oil and natural gas undoubtedly will continue to increase; oil for motive power, domestic and commercial heating, and manufacture of petrochemicals; natural gas for heating, energy uses and manufacture of petrochemicals. Substantially increased use of natural gas projected by the Gordon Commission assumes a Canadian pattern of growth similar to that in the United States, but it is too early at this stage of development to predict definitely that experience in the United States will apply in Canada. The future for nuclear fuel is the hardest to predict.

Russian Mining Developments

ACCORDING to Soviet agency reports from Alma Ata, capital of Kazakhstan, two scientists, Alexandra Brichkin, and Albert Bolotov, have developed what they have called a "cosmic drill," for use in hard rock, which works with temperatures three times as high as that of the sun's photosphere (the luminous envelope round the sun) and at cosmic velocities.

This device is essentially an electric-arc unit, which emits a high-temperature jet in the order of 15,000 deg. C. It is claimed that it burns all known hard alloys, ceramic and refractory materials, and that tests have proved it capable of drilling the hardest rocks much faster than a normal drill.

Combined Coal-cutter Loader

It is reported in "Moscow News" that the Russians have designed and built a machine which greatly reduces labour in the pits, and that this has now successfully undergone tests in the Donbass. This machine, which is operated by one man, stationed at the control panel, is described as combining the elements of a coal-cutting and loading machine, a conveyor, and a propping machine. Coal cutting along the length of a drift (about 20 metres) and loading on to the conveyor, are done by means of a chain fitted with a set of powerful cutters. As the combine moves along it automatically props the roof. All operations are simultaneous. It is claimed that the machine can cut in 3 hr. as much coal as could be turned out in two 6-hr. shifts by a mine of average capacity with ordinary equipment.

Institution of Mining Engineers

THE 66th annual general meeting of the Institution of Mining Engineers was held at the Royal Institution of Naval Architects, London, yesterday (Thursday), when Mr. R. G. Baker formally took office as president for 1960-61 in succession to Mr. T. A. Rogers. Mr. Baker's presidential address is printed in this issue (see page 243).

Certificates of honorary membership were presented to Ir. A. Hellemans and Dr. James Taylor, the Douglas Hay medal to Mr. A. E. Crook, the Laurence Holland medal and prize to Mr. Ajoy Kumar Ghose and Mr. Ivor Hawkes, the Sam Mavor students' prize to Dr. Peter Hackett, and the Stanley Walton-Brown students' prize to Mr. J. V. Wadsworth.

The institution's summer meeting will be held in Cardiff on June 29 and 30 and July 1, 1960, with headquarters at the Park Hotel.

Preservative for Timber

A colour film entitled "Timber Exposed," is now available on free loan, dealing with the advantages in the use of "Tanalith C" fixed preservative in timber subject to the worst possible hazards. The hazards dealt with are all biological and include rotting by fungal decay organisms, marine borers, insect grubs and termites. The preservative, available from Hickson's Timber Preservation Company, Limited, is impregnated into timber, under the company's supervision by a pressure vacuum technique. With a running time of 23 min., "Timber Exposed" is available for 16-mm. sound projection.

Productivity in East Midland Mines

Mr. R. RINGHAM'S REPORT FOR 1959

SALEABLE output of coal in the East Midlands Division of the National Coal Board during 1959 amounted to 44,877,472 tons, compared with 45,741,126 tons in 1958, states the divisional chairman, Mr. R. Ringham, in his report for 1959. Five-day week output increased by 230,123 tons. Output per manshift at the coal face, at 111.28 cwt., was a record, showing an increase of 6.44 cwt. on the 1958 figure of 104.84 cwt.

The highest weekly saleable output in the division in 1959 was that for the week ended December 19, 1959, when 978,575 tons were raised. Provisional output of saleable coal from mechanized faces during 1959 amounted to 23,016,610 tons, or 51.41 per cent. of the divisional output. The corresponding figures for 1958 were 20,894,096 tons and 45.97 per cent., respectively.

The total length of face and roadway conveyors in use remained approximately the same at 600 miles. The length of rope haulage fell from 26 to 20 miles, but locomotive haulage in use showed a further slight increase. The number of loading machines at work in development and special headings increased from 154 to 189 during the year. There was also an increase in the application of power stowing during the year, and additional equipment has been installed to extend this technique still further in order to gain additional experience.

Strata Control

An intensive programme of starta control investigations has been undertaken during the year, chiefly on mechanized faces, designed to improve the safety and performance of the support systems in use, and the efficiency of the faces. The year has shown a marked increase in the use of powered supports and there are now some 57 faces equipped, compared with 28 at the end of 1958.

During 1959, progress was maintained on the programme of reconstruction and development. At Bevercotes New Mine, underground drivages are proceeding for development of the first coal production panels. Permanent winding equipment is being installed in the No. 2 service shaft. The tower has been completed at the coal winding shaft (No. 2) and the multi-rope friction winder is being installed.

No. 1 shaft at Cotgrave New Mine has reached a depth of 614 yd. and the skip measuring pocket is being constructed. A further 43 yd. of sinking remain to be done. The towers at both shafts are substantially complete and No. 2 multi-rope friction winder has been installed.

The new No. 5 shaft has reached a depth of 453 yd. at Hucknall Colliery, leaving a further 169 yd. to complete the sinking. Work has started on the repairs to No. 4 shaft, 100 yd. having been carried out leaving 99 yd. to be completed.

At Cadley Hill Colliery, No. 1 surface drift has been driven a total distance of 1,025 yd. during the year, and was connected to the underground workings on January 1, 1960. Underground exploratory headings have been driven approximately 500 yd. in the Main Coal.

The surface drift at Nailstone Colliery has been equipped and was commissioned for coal haulage in July, 1959.

Winding electrification schemes have been carried out, or are in progress, at Whitwell, Silverhill and Sutton collieries, and a new coal preparation plant has been put into operation at Rufford Colliery.

Other major reorganization schemes are proceeding at Glapwell, Langwith, Blidworth, Clipstone, Mansfield, Rufford, Shirebrook, "A" Winning, Denby, Pye Hill, Babbington and Desford. Those at Sherwood and Rawdon Collieries have been substantially completed. Major schemes at present in the planning stage are proposed as follows:—Ramcroft, surface drift mine; Williamthorpe, surface drift project; Bilsthorpe, reorganization; Bentinck/Langton, surface drift scheme; Kirkby, reorganization; Moorgreen, reorganization; Brookhill, coal-preparation plant; Clifton, reorganization; Measham, coal-preparation plant; Snibston, surface drift.

Boring operations were carried out at 50 sites, of which 21 were underground, the deepest hole being one of 3,045 ft.

Three boreholes in the North Derbyshire coalfield have proved workable reserves in the Chavery, First Piper and Threequarter seams in the vicinity of Westthorpe and Ireland collieries.

Carbonization

There was no improvement in the sale of coke in 1959 and accordingly it was necessary to reduce throughput at the Avenue carbonization plant to 77.5 per cent. and at Hardwick to 75 per cent. The Grassmoor plant was operated at full throughput throughout the year on the production of "Warmco."

Extensive experiments with coal blends and with a method of activation have been successfully carried out at the Hardwick plant to produce a fuel similar in properties to the "Warmco" produced at Grassmoor. The Hardwick plant is to be put on full production of this fuel early in 1960.

Coal Output up in Czechoslovakia

Hard-coal output in Czechoslovakia in 1959 was 28,500,000 tons, which is 5 per cent. above the output in 1958. Production of brown coal also increased, amounting to over 50,000,000 tons, 6.5 per cent. above the previous year.

Firth-Brown Forge Development Scheme

THE forge development scheme, started in 1953 by Thos. Firth & John Brown, Limited, of Sheffield, with the purchase and installation of a 1,750-ton press, with all the necessary furnaces, including a 15-ton rail-type manipulator, is now stated to be working satisfactorily. Following the completion of the 1,750-ton scheme, a new shop was built for the installation of a new 800-ton press, equipped with a 3-ton mobile manipulator, and with furnaces of the most modern design. The press is being fitted with automatic precision control.

Next stage in this development scheme is the installation of a new 4,000-ton press, following the acquisition of the premises of W. Griffiths & Sons, Limited, in Brightside Lane, Sheffield. The extra room will enable the new press, due for operation by early 1961, to be installed while the old one is still working. The furnaces in this shop were of the old hand-fired type, and conversion of these to modern producer-gas furnaces will be completed by the time the new press is ready for work.

The extra room acquired, amounting in all to 5,500 sq. yd., will allow extension of the 1,000-ton press bay, where three new presses are also planned.

800-ton Press

The press, which is 26 ft. overall height, is capable of exerting a force of 800 tons through a ram supplied with water at a pressure of 4,250 lb./sq. in. The daylight or clear opening of the press is 9 ft. with a working stroke of 4 ft. The crosshead which carries the top tool is capable of exerting the full 800 tons force at a steady speed of 6 to 8 in./sec., or alternatively, can be made to give light planishing strokes at the rate of 120 per minute to finish the surface of the material under the press.

The press is controlled by an operator at a control desk with servo-operated control valves giving accurate control with the minimum of effort; physical fatigue is eliminated and the number of quick forging strokes can be considerably increased.

Power for the press is supplied by three-throw horizontal pumps driven by 550-h.p. electric motors delivering 132 gal./min. at a pressure of 4,250 lb./sq. in. to a set of air-hydraulic bottles which form a reserve accumulator for the system.

The ingots or billets to be forged are heated to between 1,150 and 1,250 deg. C. in six furnaces arranged by the side of the press. Two of the furnaces are heated by town's gas and the others by producer gas. A particular feature of the furnaces is the provision of automatic temperature and pressure control which automatically brings the pieces to be forged to the precise temperature required.

When the ingots or billets have been heated to the correct forging temperature, the bogie on which they are placed is withdrawn from the furnace and the material is picked up by a 3-ton manipulator driven by its own diesel engine weighing 20 tons. The manipulator takes the workpiece swiftly to the press where the operator and manipulator driver work in conjunction under the direction of the forgeman to shape the ingot into its final shape and size.

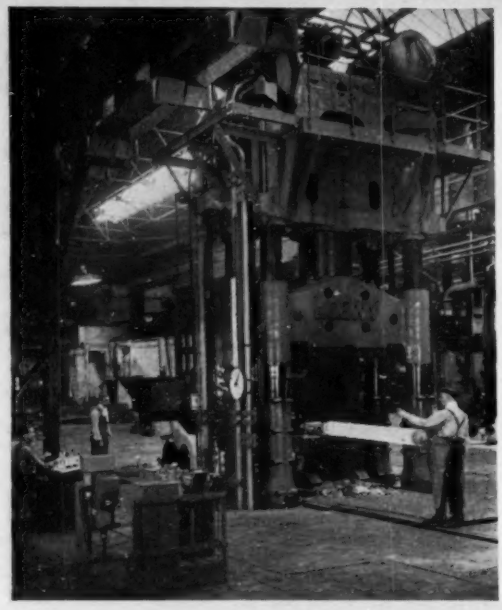


FIG. 1.—THE 800-TON PRESS IN OPERATION.

Handling

If a particularly long forging is to be handled under the press, the manipulator is assisted by a 10-ton semi-Goliath crane, which carries the end of the forging on the opposite side of the press to the manipulator, by means of a turning-over gear operating a burden chain, supporting the outer end of the forging. In this case, the crane driver, press operator and manipulator driver have to work in unison under the direction of the forgeman, and it will be appreciated that the whole operation is essentially one of team work.

The handling arrangements are completed by a 10-ton overhead electric crane which loads the furnaces and carries out general purpose duties in the shop.

Working conditions have been found to be more comfortable than those usually found in shops of this type owing to the increased efficiency of the furnaces, leading to lower heat losses and cleaner air.

CANADIAN production of primary aluminium in 1958 amounted to 633,629 short tons. The previous peak —620,321 tons—was achieved in 1956, when the industry was operating close to its 650,000-ton capacity.

Utilization of Steel Swarf

RUSSIAN FORGE-WELDING PROCESS

By P. G. MORGAN, B.Sc.(Eng.)

WITH the great increases in steel production in the world during the past few years, there has been a corresponding increase in the amounts of steel and cast-iron swarf resulting from machining operations. Some steel swarf is used for steel smelting, but the majority appears to be lost.

Steelworks are reluctant to use loose steel swarf in smelting operations due to the large volume which it occupies—more than 20 times that of the corresponding amount of cast metal. The output and productivity of open-hearth furnaces charged with swarf are drastically reduced, and there is a further loss due to burning of the swarf in remelting, so that there is a combination of increased fuel consumption and a reduction in quality of the cast billet. Further, the difficulties of the collection and transport of large quantities of swarf to steel works should be mentioned.

Other methods of using swarf have therefore been developed, and the most obvious technique is to crush the swarf before charging it into the blast furnace. Various swarf-crushing machines have been built, but the process has not been found to be economical. An alternative method involves the preparation of briquettes made from crushed swarf, dried and mixed with a solution of waterglass in water. The mixture is then pressed in metal moulds and dried. The resultant strength is very low, however, and the briquettes do not withstand the treatment involved in feeding them into the furnace. Alternative binders used in the making of these briquettes, *e.g.*, a lime, cement and water mixture, do not give much better results, but some advantages have been claimed for a cold-briquetting process under very high pressures and using large amounts of swarf.

Hot-briquetting has also been used, where the swarf is inserted in a die, heated by the passage of an electric current and subsequently pressed. Briquettes with a specific gravity of 7 have been obtained in this way, but the power consumption of up to 200 kWhr./ton of swarf is excessive, and there is considerable loss due to the burning away of the swarf. Alternatively, the swarf may be heated in a continuous furnace; in one particular case, a pressure of 50 to 100 kg./sq. cm. produces briquettes with a specific gravity of about 4.

A further development reported from Russia involves the use of a solid-fuel muffle furnace for the annealing of curled steel swarf. The swarf is first heated to 700-900 deg. C., and is then transferred to a platform where it is rapidiy spread to accelerate cooling and to reduce burning. The cooled and annealed swarf is then pressed into bales with a specific gravity of from 3.5 to 4.5, which are then charged into open-hearth steel furnaces. Another type consists of a continuous furnace, fired by solid fuel and using a recuperator, which pre-heats the furnace air to 250 deg. C. The swarf is fed into the furnace and heated to 700 deg. C. for some few minutes before being quenched by a water spray. A particular plant of this type has an output of up to 8 ton/hr.

Alloy-steel swarf is of particular importance from the point of view of recovery. The oil contained in the cutting fluid used in the machining operations yields an excessive carbon content, and, to avoid this, the organic impurities are burned away in a rotary furnace at 700-900 deg. C., leading to a reduction in both the carbon and sulphur content of the swarf; the swarf is then melted in electric furnaces to produce a charge suitable for steel smelting. This double processing is not economical, however, and the repeated heating causes a loss of the alloying elements.

New Russian Process

These methods of briquetting require large and costly hydraulic presses and do not produce a readily usable material, or even easily handled scrap. A recent Russian process which has been developed is, therefore, of interest; it involves the forge welding of steel swarf, and it is claimed that the forging so obtained can not only be used as a charge for steel furnaces but can also be utilized for the manufacture of machine components.

Forge welding consists of joining two or more pieces of metal by hammering after prior softening of the surfaces by heating. To produce high quality conventional forge welds, it is necessary to remove metallic oxides from the surfaces to be joined, by means of fluxes. Attempts to weld steel swarf into solid dense forgings, using a variety of fluxes, have produced poor results, since the pieces of red hot swarf tend to slip past one another and do not weld together. Reducing the amount of flux added has been found to improve welding quality, and good results have been obtained in welding without using any fluxes at all, irrespective of whether the swarf has been freshly produced or is largely oxidized. These results require further investigation, since it appears that the basic theoretical and practical rules applying to forge welding are invalid in this case.

Tests carried out on curled steel swarf, previously heated in a forging furnace, show that briquettes

and forgings from 5 to 40 kg. in weight can be obtained with a single blow from a 1,200 kg. drop hammer. Swarf heated to 850-900 deg. yields briquettes with a specific gravity of 6.7 to 7.2, but, with heating to 1,100 deg. C., steel forgings with a specific gravity of 7.8, *i.e.*, equal to normal specific gravity of the steel, have been obtained. Heating takes from 5 to 8 min., and the loss by burning away amounts to some 5 per cent. Solid, dense steel forgings have been obtained not only from mild steel but also from medium-carbon and medium-alloy steels.

Laboratory tests on solid forgings have shown that their chemical composition differs somewhat from that of the steel from which the swarf was obtained. In general, the sulphur and carbon contents are substantially lower in the forging than in the parent metal. It is also found that the microstructure of the swarf forgings shows a much finer grain than that of the parent metal.

The mechanical properties of the steel obtained by the forge-welding method are, in most cases, higher than those of the parent metal.

It appears, therefore, that the use of the forge-welding process represents a marked advance on previous methods of producing swarf forgings, and estimates show that the total cost may be considerably lower than other methods. The installations for the process will probably need to be of large capacity to obtain this economy of working, but there appears to be no reason why, with an adequate supply of swarf, a continuous process should not be developed. Considerable research will be needed on this forge-welding process, particularly with reference to different grades of steel, but in view of the thousands of tons of swarf produced by machining operations each year in this country alone, the development of the processes described may well be justified.

Roof Bolting in South Africa

WHEN trackless mining at an iron-ore mine at Thabazimbi, South Africa, was planned, it was realized that a system of roof control other than drift timbering would have to be employed. The use of gathering-arm loaders to replace the scraper units, and the use of shuttle cars for transporting the ore required working space to be a minimum of 15 ft. wide and 6 ft. 6 in. high.

The use of timbering would require that excavations be even larger to accommodate the timbering, and this would result in increased costs and a less stable roof.

Three types of strata formation are encountered in the ore body at Thabazimbi. At outcrops and on the upper levels of the mine the formation is hard and compact and requires little support. With increasing depth the formation is blocky with patches of unconsolidated stratum, and at deeper levels the formation provides hazardous roof conditions calling for extensive control measures, according to the journal of the South African Iron & Steel Industrial Corporation, Limited, October 1959.

Grouted Roof Bolts

After two years' extensive study of roof bolting systems, involving investigations in Sweden and France, a grouted bolt system was finally developed, which has proved successful in massive, blocky and weak types of ore formation.

After experiment it was found that a corrugated bolt (Fig. 1) gave the best result. The bolt is inserted into a hole drilled into the roof and the hole plugged with cotton waste, provision being made for an injection nozzle connected to a cementation pump, and a breather tube extending along the length of the drill hole. A grout mixture of sand and cement is then pumped into the hole around the corrugated bolt and allowed to set.

Intermediate support between bolts is provided by 2-in. diamond mesh 8-gauge wire. When the grout has set, and provided that full length bolt holes of 68 in. can be drilled in a calculated pattern, and the compressive strength of the abutments is capable of withstanding the transmitted load from the natural arch, grouted roof bolts provide a permanent anchorage unaffected by ring blasts.

Thus by binding the arched roofs with bolts of equal strength, reinforced arches are created.

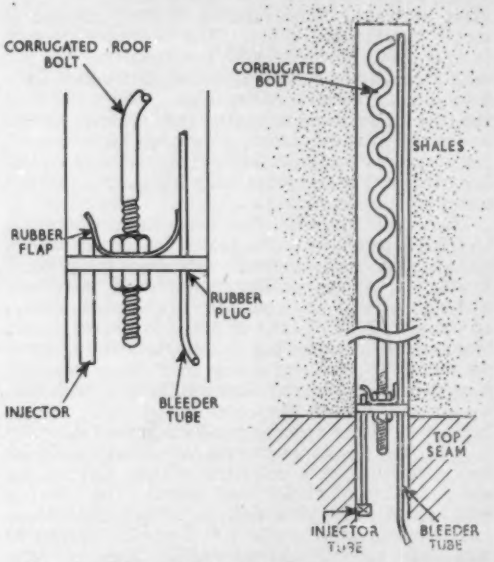


FIG. 1.—BOLT IN POSITION PRIOR TO CEMENTING.

METHANE IN COAL MINES

SMRE APPARATUS AT PHYSICAL SOCIETY EXHIBITION

SOME of the work of the Safety in Mines Research Establishment was shown last week at the Physical Society Exhibition, held in the Royal Horticultural Society's Halls, London. The scope of the display was limited to some aspects connected with the study of methane in coal mines.

As methane occurs in varying quantities in all coal seams, regular tests to detect its presence and estimate its concentration are part of the daily routine of coal mining; and one important task of safety in mines research is to provide the best possible testing equipment. Much of this work has consisted in improving the design of the flame safety lamp which remains important as a gas-detecting instrument, although it has been almost completely superseded as a lighting instrument.

Because of the element of subjective judgment involved in measuring gas with a flame safety lamp, and the inability of the human eye to perceive fine variations in the flame, the accuracy of the lamp as a gas-measuring instrument is comparatively low, and the detection of low concentrations of methane is difficult.

FIG. 1.—THE SMRE METHANOMETER.
[Crown Copyright, SMRE]

More accurate gas-measuring methanometers are available; some idea of the various principles on which methanometers have been based is given in SMRE research reports Nos. 9 and 172. Although these instruments are accurate, and do not depend nearly so much on subjective estimates, they have various drawbacks: they are too expensive for general use, or they demand skilled operation or frequent maintenance. Hence, they have been used mainly for specialized purposes.

Operation of New Methanometers

Since modern safety standards demand considerable accuracy in the measurement of low concentrations, a gap exists between the highly practical but not very sensitive safety lamp, and the accurate but inconvenient methanometer. In practice many measurements of gas concentration are made by collecting gas samples in bottles and sending them to a laboratory for analysis; the information required becomes available only after a considerable delay. Many of these measurements could be made on the spot with sufficient accuracy, if a really practical methanometer were available.

The SMRE methanometer (Fig. 1) is sufficiently accurate for general testing purposes, can be operated by unskilled personnel, and is light, compact, and reliable. It can be produced at a reasonable price and requires maintenance only at long intervals. As in some other methanometers, the methane is estimated by the change in electrical resistance of a detecting element when methane is oxidized on the element's surface. The detecting element forms one arm of a Wheatstone bridge; the other arm is formed by a "compensating" element, on which methane is not oxidized, but which is equally affected by variables, such as pressure, which affect the detecting element.

In most methanometers of this type the elements are coils of platinum wire; platinum evaporates from the surface of the elements at the temperatures necessary to oxidize methane, and the instrument requires provision for constant readjustment. An important innovation in the SMRE methanometer is that the platinum wire is embedded in a pellet of alumina; in the case of the detecting element, the alumina is coated with a palladium catalyst. Since the platinum is not exposed to the methane, and the catalyst causes the methane to oxidize at comparatively low temperatures, there is very little evaporation of platinum and the elements remain stable for

a long period. This has made it possible to simplify the design of the instrument, since no provision need be made for frequent adjustment. This type of element is sufficiently stable to allow the bridge circuit to be embedded in resin, which is a considerable advantage as regards safety, robustness, and cheapness.

The methanometer is very simple to operate: gas is drawn into the instrument by a rubber hand pump, a flexible disc on the front of the instrument is pressed, and a steady reading (on a scale calibrated in per cent. methane) is given within a few seconds. The methanometer can also be used with an extension tube for taking samples from such places as roadway roofs. Modified forms of the instrument can be used for the estimation of other inflammable gases.

Methane Roof Layers

In coal mines a primary safeguard against the occurrence of explosive methane mixtures is the mine ventilation, which dilutes the methane to a safe concentration. Methane is lighter than air, and a high concentration may persist in a thin layer at the roof for a long distance along a roadway, even when the volume of air that is passing would be sufficient to give a non-inflammable methane-air mixture if the methane in the layer were mixed with the air. Such layers may be dangerous, and it is therefore important to know under what circumstances persistent layering of methane may occur.

There is one basic reason for the persistence of such layers. Although a normal ventilation current is turbulent, in certain circumstances turbulent mixing may be reduced to a negligible rate, because buoyancy opposes the turbulent mixing of fluids of different densities.

The physical phenomenon is the same for fluids of different density other than methane and air; laboratory experiments with liquids can therefore be used to develop and to check theories to explain and describe the layering of methane in coal mines.

In the apparatus displayed at the exhibition a layer of alcohol flows over a water stream, alcohol is lighter than water, and although the water flow is turbulent the alcohol layer will not mix with the water unless the velocity is high, since the buoyancy of the alcohol will oppose the turbulent mixing. When the tube is inclined and the water stream is flowing down the tube at a low speed, buoyancy causes the alcohol to flow up the tube against the water flow.

Layering of methane is also investigated by experiments at SMRE's Buxton laboratories in a ventilated tunnel 8 ft. in height. Methane of a known concentration is emitted at the roof of the tunnel and its concentration is measured at various distances down the tunnel, so that the rate of mixing can be determined for various ventilation speeds and amounts of methane. From these studies of the turbulent mixing of buoyant fluids it will be possible to deduce the ventilation speeds required to rapidly disperse methane roof layers in coal mines.

One of SMRE's tasks is to provide scientific help for HM Inspectorate of Mines in the investigation of mining accidents. The investigation of an explosion is a particularly complex example of this work, because it is the nature of an explosion to destroy or obscure the evidence of how it occurred. To identify the cause of an explosion often involves a painstaking reconstruction of the course of events, pieced together from many small details. Many pieces of equipment, perhaps seriously damaged by the explosion, may have to be examined to determine whether a fault in any one of them could have produced a spark that would ignite methane. The microscopic appearance of samples of coal dust from roadway surfaces, the scorching of fragments of paper, or the position of equipment overturned by the explosion, may provide indications of the track along which the explosion has moved, and hence of its point of origin. The interpretation of such data often requires a wide knowledge of such subjects as the behaviour of blast or shock waves in explosions.

Model of a Methane Explosion

Such investigations are of great value to safety in mines research, since they may reveal hitherto unsuspected hazards or important gaps in our knowledge. In some recent firedamp explosions, investigations established that the explosion flame had developed in ways that were difficult to explain. Since a knowledge of the spread of flame is important not only in the investigation of explosions, but also in relation to the general properties of firedamp, it was decided to examine the behaviour of flame in small-scale transparent models of the sites of these explosions.

The model shown at the exhibition reproduces the site of the explosion in considerable detail. Methane can be fed into a roof cavity, to correspond with the gas accumulation in the actual explosion. A falling stone that brought methane down from the cavity is also reproduced; the frictional spark that ignited the methane in the explosion is represented by an electrical spark.

The flame behaviour has been found to depend on the point of ignition; the flame in the model corresponds with the full-scale flame only when the position of the igniting source corresponds with the igniting source in the actual explosion. It is still too early to say whether such models could be used to provide a complete explanation of an explosion in which other evidence was lacking or deficient; the relation between the full-scale and small-scale phenomena is still being investigated.

FRENCH iron-ore production in the first nine months of 1959 totalled 44,581,000 tons (44,439,800 tons in the same period of 1958), while deliveries increased to 44,506,000 tons (43,283,400 tons). According to "Nord Industriel," Lille, deliveries to French works rose to 26,303,000 tons (25,688,800 tons) and exports to 18,203,000 tons (17,594,300 tons), of which 10,968,000 ton (10,155,700 tons) went to Belgium and Luxembourg, and 5,953,700 tons (6,222,100 tons) to the Saar.

Company News

JAMES BOOTH ALUMINIUM

Delta Metal's Link With Kaiser Undertaking

FORMATION by the Delta Metal Company, Limited, London, S.E.10, is announced of a new company, James Booth Aluminium, Limited, to acquire the whole of the aluminium and light alloy interests of its existing subsidiary company, James Booth & Company, Limited, Birmingham. Issued capital of the new company will be £10,000,000, of which Delta Metal will contribute £5,000,000 by way of existing assets, and the Kaiser Aluminium & Chemical Corporation, of the US, £5,000,000 by way of additional finance.

The new finance will be used to expand and re-equip the company's works at Kitts Green, Birmingham, which will then become one of the most modern manufacturing plants of its kind in the country. It will be capable of producing a complete range of commercial products, as well as the more specialized lines with which the company's trade name "Duralumin" has been particularly associated in the past.

Management of James Booth Aluminium will remain in the hands of the Delta group. The board will comprise:—Mr. W. E. Ogden (chairman of the Delta Metal Company), chairman; Mr. W. W. Dolton, Mr. W. J. Vaughton, Mr. A. F. Thomas, and Mr. D. H. H. Clarke (all from the Delta group); Mr. D. A. Rhoades, Mr. T. J. Ready, and Mr. A. H. Branstad (all from Kaiser Aluminium). Mr. Vaughton has been appointed managing director and Mr. Branstad assistant managing director. Sir Horace Clarke, the present chairman of James Booth & Company, has been invited to become honorary president.

Provision has been made to ensure that control of the new company will not pass out of the United Kingdom.

METROPOLITAN GAS METERS, LIMITED—A cut of 5 per cent. brings the dividend for the year ended September 30 down to 10 per cent. Group profits amounted to £11,026 (£12,733) after tax of £9,180 (£14,321).

CYRIL ADAMS & COMPANY, LIMITED, machine-tool makers, of New Barnet (Herts)—All the company's capital has been acquired by the Staveley Coal & Iron Company, Limited, Hollingwood, near Chesterfield.

SYMONDS ENGINEERING COMPANY, LIMITED—An interim of 10 per cent. is declared for the year to March 31, 1960, as forecast when the shares were introduced last November. A final of 17½ per cent. was also foreshadowed.

UNIVERSAL ASBESTOS MANUFACTURING COMPANY, LIMITED—The dividend is raised to 1s. 6d. (1s.) per 5s. share for the year to September 27, 1959. Group net profit expanded to £313,800 (£151,933), after tax of £219,465 (£183,304).

HERMAN SMITH, LIMITED, sheet-metal workers etc., of Dudley (Worcs)—As forecast when the company was made public last February, a dividend of 25 per cent. is being paid for the year ended June 30, 1959. Group net profit was £136,492 and tax was £68,326.

FLETCHER, HOUSTON & COMPANY, LIMITED, engineers and ironfounders, of Tipton (Staffs)—Arrangements have been entered into for the purchase of a private company in the Midlands carrying on a substantial and old-established business. The price is approximately £420,000 cash.

GENERAL CABLE MANUFACTURING COMPANY, LIMITED—Group trading profit for the year ended September 30, 1959, was £68,886 (£168,792). Profit, before tax of £9,012 (£56,521), was £20,786 (£116,686). There is no dividend on the ordinary, compared with 15 per cent. previously.

J. B. BROOKS INDUSTRIES, LIMITED, manufacturers of metal furniture, cycle and motor cycle accessories, etc., of Birmingham—A cash distribution of 5s. per £1 ordinary unit, tax free, is proposed to holders of January 20. The company realized £350,000 on a sale of property last June.

ENGLISH CHINA CLAYS, LIMITED—Group profits increased to £3,284,294 (£2,538,182) for the year to September 30, 1959, and following the higher 2½ (2) per cent., tax free, interim, the final dividend is raised by 1 per cent. to 6½ per cent., tax free. A proposed one-for-five scrip issue to holders of the £5,709,982 ordinary capital is also announced.

PERMUTIT COMPANY, LIMITED, manufacturers of water treatment plant, etc., of London, W.4—The directors regard the provisional figures for 1959, subject to audit, as satisfactory and have decided to start interim dividend payments with a declaration of 7½ per cent. The single dividend for 1958 was 15 per cent.

SHANKS & COMPANY, LIMITED, sanitary engineers and ironfounders, of Glasgow—The final dividend is increased by 2½ per cent. to 10 per cent., making 12½ per cent. for 1959, against 10 per cent. Profits have risen from £90,064 to £120,105 after tax of £92,898 (£81,663) and bringing in £10,000 (same) from staff pension reserve to meet cost of past service pensions.

VOKES, LIMITED, filtration and silencing engineers, of Guildford—The interim dividend is raised from the equivalent of 3½ per cent. to 5½ per cent. for the year ending March 31, 1960, on a capital doubled by scrip issue. A 12½ per cent. total for 1959-60 has been forecast on the £1,020,000 ordinary capital. A similar equivalent total was paid for the previous nine months.

JOHN FOWLER & COMPANY (LEEDS), LIMITED, manufacturers of tractors and locomotives—There is a dividend of 15 per cent. for the year to September 30, 1959. No dividend was paid for the previous year. Net profits were £53,171 (loss, £16,064) after tax £8,236 (nil) and depreciation £38,054 (£44,580). The company is a subsidiary of Marshall Sons & Company, Limited.

NEWMAN, HENDER & COMPANY, LIMITED, iron and

non-ferrous founders, etc., of Stroud (Glos)—A rights issue is to be made of 753,239 10s. ordinary shares at 22s. 6d. each on a one-for-three basis. The issue will provide not only for the acquisition of Sydney Smith & Sons (Nottingham), Limited, but also working capital and further requirements for the development of the Canadian subsidiary.

C. LINDLEY & COMPANY, LIMITED, bolt and nut manufacturers and engineers' merchants, of London, N.1—Since the annual statement was prepared early in December sales had continued to rise, the chairman, Mr. S. A. Wale, said at the annual meeting on Monday. Samples of continental wire were considered satisfactory by the company's wiredrawers and with that aid the company's material supplies for the year would be amply covered.

DAVID ROWAN & COMPANY, LIMITED, marine engineers and boilermakers, of Glasgow—The company has acquired the whole of the issued share capital of the marine engineering firm of Rankin & Blackmore, Limited, Greenock. Both companies are members of the Lithgow group. Mr. James Ferrier has resigned from the board of Rankin & Blackmore (which will continue as a separate business), but remains a director of other companies in the group.

BRITISH OXYGEN COMPANY, LIMITED—The directors attribute the increased profits to widespread expansion and improvement in operations oversea and important contracts at home undertaken by the engineering division. Group profits for the year ended September 30, 1959, were £12,926,867 (£11,319,153), tax took £4,065,754 (£3,890,438), and net profit is £4,521,390 (£3,334,062). The dividend is effectively raised to 14 (12) per cent. with a final of 10 per cent.

PLASTIC ENGINEERS, LIMITED—Dividend is being raised to 22½ (15) per cent. for 1959, with a final of 15 per cent. on the £98,700 capital. The company proposes to make a two-for-five scrip issue to holders of March 23. The profit, before tax, expanded to £87,143 (£34,310). The current position is healthy and the outlook, state the directors, is encouraging. Present trading and outlook indicate that profits for 1960 should, at least, be maintained, as should the present annual dividend of 22½ per cent.

BTR INDUSTRIES, LIMITED—Group profits have dropped from £749,394 to £579,135 for the year to September 30, 1959. A final dividend of 10 per cent. is announced, which reduces the total ordinary dividend by 2½ per cent. to 12½ per cent. Net profits were £328,953, compared with £348,120. This was after a much lower tax charge of £250,182 (£401,274). The directors state that although adverse trading conditions continued for the greater part of the period, there was improvement towards the end of the calendar year. The outlook is encouraging.

WM. PARK & COMPANY, FORGEMASTERS, LIMITED—"The order-books generally and the activity so far this year leads me to hope with confidence that the current year will produce results at least as good as last year," says the chairman, Mr. Cyril J. Park. He gives warning, however, that the reduced working week at present being negotiated is likely to increase costs. Reduced profits will then be probable as prices could not be raised because of competition, especially in the export field. He is "not sanguine" about the prospect of increasing production to offset the rise in costs.

C. & J. HAMPTON, LIMITED, ironfounders and makers of engineers' and woodworkers' tools, of Sheffield—The improvement which was becoming apparent last August is continuing, but difficulties remain in certain export markets affected by quotas and licences. A rise in manufacturing costs would seem inevitable following present wage negotiations in the engineering industry. On balance the board views the immediate future with confidence, states the chairman, Mr. A. B. Hampton, but reminds holders that the proposed one-for-two scrip issue does not imply an increase in the future distribution.

HEPWORTH IRON COMPANY, LIMITED—For a total cash consideration of approximately £380,000, the company has acquired the whole of the 11,000 6 per cent. £1 preference, over 99 per cent. of the 125,000 2½ per cent. £1 preference, and the 125,000 "A" ordinary 4s. shares of the Albion Clay Company, Limited. It is intended to exercise the statutory right to acquire the 2½ per cent. preference and "A" ordinary shares in due course. It is stated that the two companies are complementary to each other and the amalgamation will strengthen their position as well as allowing various economies to be made.

H. M. HOBSON, LIMITED, manufacturers of aircraft engine components, of Wolverhampton—Although new orders arising from the requirements of defence aircraft have been affected, the directors report that due to the policy of providing highly specialized plant, equipment, and technical ability, the order-book has been maintained at a satisfactory level, both in the military and civil fields. New products are being developed and the directors have confidence in the future of the company. The dividend for the year ended September 30, 1959, is being effectively raised to 15 (12½) per cent. and the consolidated net profit is £364,289 (£379,168).

Holding Company for Metal Closures

TO co-ordinate the activities of the two main companies, a holding company is to be formed in consequence of the merger between Metal Closures, Limited, West Bromwich, and John Dale, Limited, London, N.11. The undertaking of Metal Closures, as it existed before the merger, is being transferred to a new operating company in exchange for the whole of the issued share capital of that company, and that company will thereupon become a wholly owned subsidiary of Metal Closures.

The board of the new operating company will be the same as the board of Metal Closures before the reconstruction with Mr. W. R. Gamble as managing director. The reconstituted board of Metal Closures will be:—Mr. K. D. Erskine, chairman; Mr. L. Robert Carr, MP, deputy chairman (executive); Mr. S. E. Clotworthy, deputy chairman; Mr. W. R. Gamble (executive); Mr. P. J. A. Lachelin; and Mr. W. E. H. Jones. Shareholders are to be asked to give what consents are requisite, including the approval of the change of the company's name to Metal Closures Group, Limited. The new operating company will thereupon be Metal Closures, Limited.

SHIPMENTS OF coal and coke to home and foreign destinations from the South Wales ports last week totalled 53,826 tons, compared with 60,976 tons in the previous week and 60,514 tons in the corresponding week of last year. Details of last week's shipments (with the corresponding 1959 figures in parentheses) were:—Newport, 12,065 (10,460) tons; Cardiff, 5,033 (11,056) tons; Penarth, 4,787 (4,992) tons; Barry, 12,057 (11,224) tons; Port Talbot, 1,017 (1,088) tons; Swansea, 18,867 (21,694) tons.

IRON AND STEEL TRADE

INITIAL reactions of the steel trade to the advance in Bank Rate have been imperceptible. The rising trend of the market continues. Very considerable projects of industrial expansion, embracing new factories and equipment, are afoot. Expenditures of the motor vehicle and steel industries are expected to increase this year by no less than 50 per cent., and if stockpiling is discouraged it will be no great disaster since demand for steel products is approaching the maximum capacity of the industry.

The reduced levies on iron and steel output which were proposed by the Iron and Steel Board last November, are to come into force as from Sunday, according to an Order made by the Minister of Power. In each case the levy is lowered by ½d. a ton; that on leviable steel ingots will be 2½d. a ton, and that on leviable iron 2d. a ton.

The sums raised are used to finance the Iron and Steel Board.

Pig-iron

Recovery in the foundry industry has created a better demand for high-phosphorus pig-iron, bringing current consumption into closer alignment with production. The expansion in the basic iron requirements of the steelworks is, of course, much more spectacular. As between December, 1958, and December, 1959, there was a rise of 25 per cent. in pig-iron output.

Further expansion is indicated, as the steelworks are carrying no more than normal stocks and consumption now probably amounts to nearly 300,000 tons a week.

Ferro-alloys

No change is recorded this week in the price of ferro-tungsten, the demand for which is relatively steady at the moment. Ferro-vanadium is in fair request, while ferro-molybdenum is quite active. The demand for ferro-silicon remains at a good level. Both ferro-chrome and ferro-manganese are well supported. There is a steady request for supplies of calcium silicide. Silico manganese is quite active.

Interest in ferro-niobium and ferro-titanium is maintained. Chromium metal is in fair demand, while the call on silicon metal shows little change.

Semi-finished Steel

In the semi-finished steel trade there is no essential change. The output of the billet mills has very considerably increased, but supplies are fully absorbed.

Home demand for slabs has also reached its highest peak, and the purchase of supplementary tonnages from western Europe would not occasion much surprise, though this, of course, would only be a temporary expedient, since the steel industry's plans envisage complete self-sufficiency in the semi-finished steel trade.

Finished Steel

The most spectacular development in the finished steel trade is the mounting demand for constructional material of all shapes and sizes. The heavy rolling mills were the last to catch the freshening breezes of the revival, but short-time working is now a thing of the past.

Big tonnages of plates, joists, and sections are now on order and the indications are that the best is yet to be.

IMPORTANCE OF DESIGN TO SHEFFIELD

PLEA for an English tradition in knives, forks, and spoons was made by the Master Cutler, Mr. P. J. C. Bovill, managing director of Newton, Chambers & Company, Limited, Thorncliffe, near Sheffield, presiding at a dinner last week to mark the inauguration of the Sheffield Design Council. It would take a long time, he thought, to establish the tradition and the burden would fall first on the large firms, but he was sure that the reward would come in due course.

Mr. Elkan Simons, chairman of the Design and Research Centre for the Gold, Silver, Jewellery, and Allied Industries, which has inaugurated the new council, said that other countries were increasingly taking the lead in design and might well capture the markets in consequence. The new council should set its sights high and endeavour to persuade industry to ally its quality and craftsmanship with new design in keeping with this modern age.

Mr. Peter Inchbald, managing director of Walker & Hall, Limited, Sheffield cutlers, and chairman of the design council, earlier recorded a television interview from Manchester in which he said he was convinced the world was at the beginning of a new industrial civilization with a new approach to design. "It is ridiculously obvious that the world is going that way—and we must go with it," he said.

Record ECSC Iron Ore Output

RECORD output of 88,283,000 metric tons of iron ore was produced in 1959 by the six countries of the European Coal and Steel Community. The 1958 total was 87,075,000 tons and in 1957, the previous record year, 87,435,000 tons was produced.

Principal outputs came from France—61,651,000 (60,186,000) tons—and West Germany—17,948,000 (17,984,000) tons, but the biggest percentage increase was recorded by Belgium—142,000 (124,000) tons, a rise of 14.5 per cent.

Throughout the Community the average iron content of the ore produced was about 30 per cent.

FOLLOWING THE appointment of Mr. R. G. C. Cowe, formerly deputy secretary, to be secretary of the National Coal Board, it has been decided that the duties previously performed by the deputy secretary and by the head of the board's Central Secretariat should be reallocated between two under secretaries. Mr. W. J. S. McKinnell, at present head of Central Secretariat, and Col. F. W. Webb, head of Secretariat, Scientific Department, have been appointed to these two posts.

Coalfield News

A Better Outlook for Coal

OUTLOOK for the coal trade was not as black as it was two years ago, Dr. William Reid, chairman of the Durham Divisional Coal Board, told a meeting of colliery officials in Durham. There was tremendous pressure to find new export markets and to retain markets at home, he said.

The revival in the steel industry was an important factor, said the chairman, and it was hoped that this year the board's sales would match production. Every effort had been made to improve efficiency and reduce the cost production. It was only in this way that the board could maintain its policy of continuity of employment.

A presentation was made at the meeting to Mr. Joseph Crawford, secretary of the Co. Durham branch of the National Association of Colliery Overmen, Deputies, and Shotfirers, who has been appointed national secretary of the association.

MRS. E. H. BROWNE, wife of the chairman of the West Midlands Divisional Coal Board, will open Lea Hall Colliery, at Brereton, near Rugeley, on July 19.

ONE MINER was killed and two others seriously injured when a set of tubs ran down an incline at Newbiggin Colliery (Northumberland) on Thursday of last week. The tubs ran away when a cable broke.

THE EXECUTIVE of the Scottish Area of the NUM has been informed that 63 men under 65 years of age are still unemployed as a result of 28 pits closing in Scotland last year. Nearly 200 men over 65 have retired and 297 have left for other employment.

A SMOULDERING SECTION of conveyor belt 860 yds. below ground was tackled by rescue workers at Yorkshire Main Colliery, Edlington, near Doncaster, early on Sunday. The danger was eliminated after two hours' fire-fighting and on Monday the Coal Board declared the colliery free from toxic fumes.

SOME 50 MINERS at Westerton and Moor Hill collieries (Co. Durham) will receive notice today (Friday) because of the poor quality of the coal being produced. About 40 of the redundancies will be at Westerton, from which another 50 men are to be transferred to nearby collieries. Transfers from Moor Hill to New Shildon Colliery will number 14.

A STRIKE of 300 miners at Solway Colliery (Cumberland) over the pit's safety precautions ended after 24 hours on Thursday of last week. A length of underground conveyor belting damaged by friction was found and gave rise to some alarm. The men decided not to go underground again until adequate precautions were taken against the possibility of fire.

MORE THAN 260 MEN were sent home from Markham No. 1 pit, near Chesterfield, last Friday, after a metal tub weighing more than a ton had crashed 1,000 ft. down the winding shaft. The tub was being taken down to the pit bottom. It rolled out of its cage into another cage and was brought up with a load of coal. The second cage was damaged and needed replacement.

NEW PITHEAD BATHS, catering for 2,500 men, and a canteen and office block at Gedling Colliery, Nottingham, are to be opened tomorrow (Saturday) by Mr. R. Ringham, chairman of the East Midlands Divisional Coal Board. The new installations, which cost £260,000, also include a medical centre, lamproom, and parks for cars and bicycles. Work on the project began at the end of 1957 and was carried out by Ford & Weston, Limited, Derby.

Coal Chartering

MAIN activity in the coal market from Hampton Roads has been centred on the Japanese trade and, despite the volume of tonnage recently fixed, charterers are still showing interest in February and forward loadings. Rates have varied somewhat depending on size and actual position; for January $8.70 has been reported and for January/February $8.40 and $8.50. Subsequently, however, a 13,000-tonner has been fixed for three voyages at $8.50.

As far as the Continent is concerned, 9,500 tons for January/February has been fixed to Antwerp, Rotterdam, or Amsterdam at 29s., this being a relet cargo, but about 27s. is the nominal rate provided further business is available. A 12,000-tonner for February 12 to 29 has accepted this figure to Ymuiden or Amsterdam, although this section of the market is lifeless.

There is some interest on South American account and $5.40 has been paid for a 9,500-tonner, loading January, to Rio Janeiro and tonnage is also required for the Lower Plate. There is also interest on the part of Italian receivers and a 16,000-tonner for late January/early February is reported fixed to West Italy at $4.50, which appears to be about the present day value.

The market is quiet from the UK with Wales/West Italy arranging 4,200 tons for about February 22 at 26s. From the Continent, Gdynia or Gdansk/Buenos Aires or La Plata has taken two vessels, each about 10,000 tons, for March 1 to 31 at 38s., which rate is virtually unchanged.

Yorkshire Winding Enginemen Face Expulsion from NUM

LEADERS of the National Union of Mineworkers in London on Thursday of last week decided to recommend the expulsion of one of its constituent bodies—the Yorkshire Winding Enginemen's Association. A resolution to that effect will be moved at the NUM's annual conference at Llandudno in July, but the members of the YWEA will probably be invited to remain as individuals in the NUM.

After the NUM had issued a directive last year that the association must merge with the union by January 1, 1960, " or accept the consequences " the association held a ballot. All but 17 enginemen decided in favour of retaining separate identity.

The association, with a number of others, was allowed to retain its own branch organization and officials when the union was formed in January, 1945.

Daniel Adamson in Take-over Bid

AN offer has been made and accepted on behalf of the shareholders of Daniel Adamson & Company, Limited, the Dukinfield firm of engineers and boilermakers, for the entire ordinary share capital of Hatchett & Company, Limited, constructional engineers, of Hyde (Cheshire). There has also been an offer for the preference capital.

The present chairman of Hatchett & Company, Mr. R. Genese, who wishes to retire for health reasons, will resign from the board when completion takes place shortly. His place will be taken by Mr. G. N. C. Flint, a director of Daniel Adamson, whose secretary, Mr. S. Shenton, will also join the Hatchett board. Otherwise, its management will be unchanged, with Mr. G. Harper Mutch as managing director.

THE COAL TRADE

INDUSTRIAL fuel demands are at a fair level, but, with a few exceptions, supplies are coming forward satisfactorily. On the domestic side of the trade, merchants' order-books are well filled. Pressure for deliveries by householders has eased somewhat with the higher temperatures, but trade remains much more lively than it has been for a long while and it is quite a common occurrence for customers to be kept waiting several weeks for their supplies.

WEST MIDLANDS

A good deal of pressure has developed for all classes of house coal and deliveries in smaller lots than usual are much more prevalent. While moderately-priced coals are the most popular lines, best selected coals are readily taken up. Householders are far less inclined than they were to refuse house nuts and prompt delivery is more important nowadays than quality. The well-advertised manufactured fuels are most difficult to get hold of and stocks at merchants' depots have now virtually disappeared.

The shortage of anthracite coals shows no signs of becoming less acute. Best stove nuts, beans, and grains cause most merchants headaches and deliveries are usually spread over the widest delivery range. Boiler nuts are now difficult, while some of the special-purpose fuels from a distance have to be brought through by road. The market for domestic coke has livened considerably and demand is at a high level. The supply position remains good and there are few complaints about shortages.

Manufacturers' requirements have increased in recent months, but apart from slight delays in delivery of singles and doubles, supplies of industrial coals are pretty good. Boiler slack is not difficult to get. Most manufacturers are lifting stocks, but they appear to be still sufficient to take care of any shortages which might be experienced. The market for hard coke is now much stronger than it was.

Consolidated Zinc Contracts for Woodall-Duckham

AS part of its £8,000,000 expansion programme at Cockle Creek, near Newcastle, New South Wales, Consolidated Zinc Proprietary, Limited, has awarded a number of contracts to a total value of approximately £650,000 to Woodall-Duckham (Australasia) Pty., Limited, a member of the Woodall-Duckham group of companies.

The principal item embodies the construction of the blast-furnace section and ancillary equipment for an Imperial Smelting type zinc smelter developed in the UK by Consolidated Zinc.

This plant is the result of extensive research and large-scale prototype plant tests at Avonmouth extending over many years. The process is the first to utilize the principle of a blast furnace in zinc smelting and can simultaneously produce a similar quantity of lead metal.

COAL SHIPMENTS from Blyth (Northumberland) last year amounted to 5,151,402 tons, an increase of 107,644 tons on 1958. There was an increase of nearly 100,000 tons in shipments oversea.

£10,500 for Miners' Widows

FOLLOWING the deaths of two West Cumberland miners in pit accidents damages totalling £10,500 were awarded to their widows at Carlisle Assizes. Both claims were against the National Coal Board.

Mrs. Elizabeth Nicholson, whose husband, Mr. Thomas Henry Nicholson, was killed while working at Haig Colliery, Whitehaven, was awarded £6,250. Mr. Guthrie Jones, for Mrs. Nicholson, said that the accident occurred while shotfiring was in progress. There was a fall of roof and Mr. Nicholson was killed. There were two dependent children.

Mrs. Leah Jane Reay was awarded £4,250. Her husband, Mr. George Reay (52), was a faceworker at Harrington Colliery, Lowca, and he was killed in a mine accident in July, 1958. There were two dependent sons.

Miner's £5,500 Damages

DAMAGES of £5,500 and costs were awarded at Carlisle Assizes to Mr. George Graham Anderson (53), a miner at Lowca Colliery, near Whitehaven. Mr. D. Brabin, QC, for the plaintiff, said Mr. Anderson's left hand was injured and rendered useless in a pit accident. He had been told to dismantle a bent forepole or girder which should not have been erected in the first place.

For the National Coal Board Mr. C. M. W. Elliot submitted that the plaintiff had to satisfy the judge that he had been asked to take an unnecessary risk and the Coal Board had not exercised reasonable care for his safety.

Mr. Justice Paul said he was satisfied that the removal of the bent forepole ought to have been done by three men. He found negligence on the part of the NCB and could find no contributory negligence by Mr. Anderson, who was doing the job the best way he could.

Israel Aid for Burma Fuel

WITH the aim of supplying Burma with coal and coke, the Burmese Defence Services Institute has formed a joint subsidiary with the Israeli coal concern, Pehan Israel Coal Company, Limited. The company is to be called the United Coal & Coke Suppliers & General Trading Company, Limited, and will be owned 55 per cent. by the Burmese and 45 per cent. by the Israeli concern.

As well as importing coal and coke into Burma, it will undertake an exploration of Burma's own coal deposits. Another of its tasks will be the education of Burmese youth in the coal-mining industry, including oversea schooling. All coal imports will in future be carried out by the Burma Five Star Line, a subsidiary of the Defence Services Institute, under Israeli management.

Law Cases

Judge Disallows "New Form of Legal Aid"

ORDER for the compulsory winding up of Luzon Trading (Iron & Steel), Limited, metal merchants, of London, S.W., has been made by Mr. Justice Roxburgh in the Chancery Division, on the petition of the Board of Trade. Mr. E. Blanshard Stamp, for the Board of Trade, said the company's capital was £100. It was incorporated in February, 1957, and ceased to carry on business the following October. It was now insolvent.

In November, 1958, a shareholder, Mr. Everard Digby, applied to the Board of Trade for an investigation to be held into the company's affairs. An inspector's report disclosed that irregularities appeared to have occurred in the conduct of the company. A director, aided by an ex-director, had, it was alleged, made use of £597 of the company's money.

Mr. Digby, who appeared in person, opposed the making of a compulsory order. He said he was the secretary and a director of the company besides being a shareholder and a creditor. The making of an order for compulsory liquidation would be premature and unjust to the shareholders and creditors. The company was not insolvent because there was £597 owing to it by two men. It was a debt which the Board of Trade had a duty under the Companies Act to recover by civil proceedings for misfeasance.

The judge: "The assets of this company may be about £20. Why should the State recover money for you at the expense of myself and other taxpayers? If you are anxious to have civil proceedings you might persuade the Official Receiver to take them if you undertake to indemnify him."

Mr. Digby: "Civil proceedings are a State matter in this case. There is a public issue and the Board of Trade should take the proceedings."

His lordship said he thought Mr. Digby wanted to recover money to swell the company's assets for the benefit of himself and his supporters at the taxpayers' expense—in other words, a new form of legal aid. There were limits to the extent to which the taxpayer should subsidize litigation. It was just and equitable to make a compulsory winding-up order.

BREACH OF FACTORIES ACT

HELLIWELLS, LIMITED, makers of straight and manipulated electrically welded tubing, of Aberdare, was fined £50 with £21 costs at Aberdare for failing to ensure the safety of an overhead crane.

It was stated that a painter employed by a firm doing maintenance work for Helliwells lost four fingers and sustained other injuries to his right hand when a wheel of the crane passed over it. The painter was working on a length of steam pipe and at times had to work from the crane track because it was too awkward to work from ladders.

For the company, Mr. R. S. Gardner suggested that the painter went to work on the steam pipe without telling his foreman or the crane driver of his whereabouts. The stipendiary, Mr. Joshua Davies, QC, said, however, that there was no doubt that there had been a definite breach of the Factories Act.

DEFINITION OF A MINE

JUDGMENT for the South Staffordshire Mines Drainage Commissioners for £757 17s. 8d. with costs has been given in the High Court against the Grosvenor Colliery Company, Limited, Caledonia Quarry Bank (Staffs), in respect of a surface drainage rate for 1954 to 1957. The defendants claim that since 1954 they had adopted open-cast mining instead of underground mining and were not liable to pay the rate.

Giving judgment, Mr. Justice Winn said it seemed odd that if, as had been submitted for the defendants, the word "mine" was limited to the mining of an excavated, subterranean cavity, one should find reference in the private mining Act of 1873 to exhaustive mining. It did not seem natural that one should think the word "mine" should mean "a seam of mineral" rather than a whole cave or tunnel covered by earth.

A LOCHORE (FIFE) colliery developer, John Reid, was fined £12 at Dunfermline Sheriff Court for leaving 3 lb. 6 oz. of explosives on the footpath at the entrance to Mary Colliery, Lochore, on December 18. Reid told the manager he had left the canister on the footpath while he went to the pithead baths.

Iron-ore Imports

IMPORTS of iron ore and concentrates (except chrome iron ore and roasted iron pyrites) in December, and the totals for 1959 and 1958, are shown in the table below. The figures for 1959 are not completely comparable with those for the previous year.

From	Month ended Dec. 31.	Year ended December 31.	
	1959.	1958.	1959.
	Tons.	Tons.	Tons.
Sierra Leone	105,945	728,118	764,340
Canada	138,702	2,230,540	2,731,936
Other Commonwealth countries and Eire	1,850	2,404	24,697
Sweden	272,948	3,151,218	3,111,203
Norway	57,964	285,726	308,911
France	46,397	486,986	439,422
Portugal	25,726	129,718	260,584
Spain	47,559	596,295	467,861
Algeria	159,035	1,420,323	1,459,940
French West Africa	29,968	337,237	250,393
Tunisia	89,460	581,645	570,631
Morocco (excluding Tangier)	71,192	500,945	414,993
Liberia	31,700	285,091	364,993
Venezuela	148,400	1,393,179	1,412,899
Brazil	46,872	576,373	555,540
Other foreign countries	15,786	192,895	176,877
TOTAL	1,289,504	12,898,693	13,315,220

NEW STEEL TUBE COMPANY

DETAILS are announced of the new joint company formed by Stewarts and Lloyds, Limited, and Imperial Chemical Industries, Limited, to manufacture and sell extended surface steel tubes. It has been registered as the Extended Surface Tube Company, Limited.

New plant is being installed at the Corby works of Stewarts and Lloyds for the manufacture of "Integron" integrally finned steel tubing and of applied fin tubing using high-frequency electric welding. Sales will be directed from the Stewarts and Lloyds' sales office at Broad Street Chambers, Birmingham 1 (telephone: Midland 9181).

Obituary

Mr. PAUL TUKE, who died on Saturday at the age of 56, was chairman of Tuke & Bell, Limited, sewage and hydraulic engineers, of Lichfield (Staffs).

The death occurred on Sunday of Mr. GEORGE CHARLES WILLIMENT, who was assistant managing director of Armco, Limited, steel fabricators and foundrymen, of London, W.1.

Mr. RICHARD G. HEWITT, who died last Friday aged 62, was a co-founder of Hewitt & Topham, the Keighley gear ring manufacturers. He was president of Keighley Association of Engineers in 1946.

The death occurred last Friday of Mr. HAROLD ALBERT BIRCH, managing director of H. A. Birch & Company, Limited, electrical engineers, of Willenhall (Staffs). Mr. Birch founded the firm 27 years ago.

The death has occurred of Mr. THOMAS G. FORRESTER, chairman of Ferens & Love (1937), Limited, colliery owners and firebrick manufacturers, of Durham, and of the Durham Brick & Tile Company, Limited.

Mr. HARRY NEWTON, who died on Saturday, was for 53 years a partner and director of Israel Newton & Sons, Limited, engineers and boilermakers, of Bradford. He retired from the chairmanship of the company two years ago. Mr. Newton was 78.

Mr. JAMES HAY, whose death is reported, was formerly works manager of T. R. Dowson & Company, Limited, marine engineers, boilermakers, etc., of South Shields (Co. Durham). He was 71. Mr. Hay retired last year. Apart from the period when he served his apprenticeship with Brigham & Cowans, Limited, South Shields, he had been associated with T. R. Dowson & Company since he was 12.

Mr. WILLIAM LEO KELLEHER, who died on Wednesday of last week at the age of 81, was a director from 1915 until his retirement in 1938 of T. P. Rose Richards & Company, coal shippers, etc., of Swansea. He served the company for over 40 years. Mr. Kelleher took a leading part in the development of sales abroad of Welsh anthracite and steam coals. During the first world war he was a member of the advisory committee for the supply of coal to France and Italy.

Among those killed in the recent air disaster in Turkey was Mr. RUNE LEMNER, manager of the marketing department of Atlas Copco, A.B., Stockholm. He was flying from Stockholm to make a survey of the sales activities of the Atlas Copco organization throughout the Middle East. Mr. Lemner joined Atlas Copco in 1943 as a sales engineer. In 1945 he became sales service engineer in Buenos Aires. A transfer to the group's Peruvian company followed in 1950, and he was appointed managing director of that company in 1953. He became marketing manager of Atlas Copco last September. Mr. Lemner was 41.

TURKEY'S NEW STEEL INDUSTRY

A NEW steel industry is to be established in Turkey. Agreement in principle has been reached for the Development Loan Fund to advance $105,000,000 (about £36,000,000) towards the cost of a new steelworks at Eregli, on the Black Sea coast.

Construction will be in three phases. The first will increase annual output by 300,000 tons, and when completed, the final scheme will raise output by 1,000,000 tons, saving the country $50,000,000 in foreign exchange.

F. H. Lloyd's Part in Indian Development

CONTRACT to act as consultants for the Indian Railway Board for the design, erection of buildings, installation of plant and equipment, and the training of personnel for a steelfoundry has been secured by F. H. Lloyd & Company, Limited, Wednesbury (Staffs), in the face of world-wide competition.

The foundry, which is to be built at Chittaranjan, West Bengal, will produce steel castings for locomotive construction, and initially the annual output will be 7,000 tons for the planned construction of 200 locomotives per year.

Chittaranjan, where the locomotives will also be built and where other large engineering projects are planned, is one of India's "new towns." Begun in 1948 in comparatively open country 150 miles from Calcutta, the town now has a population of over 35,000. The Indian Railway Board operates one of the major railway systems of the world, having 34,000 route miles and more than 8,000 system locomotives. The new steelfoundry will, therefore, play a significant part not only in the development of Chittaranjan but in the economic and social development of the whole country.

The foundry will be sited adjacent to the main assembly bays of the locomotive works and will cover an area of 164,000 sq. ft. The principal buildings will accommodate melting, coremaking, light and heavy foundry, and dressing shops, heat-treatment, inspection, and despatch. Auxiliary buildings will provide for X-ray and other non-destructive testing facilities, sand and metallurgical field laboratories, lockers, and washrooms, and electrical power supply.

After design and selection of plant and machinery has been decided a site engineer will go to India and be responsible for erection and installation. A team of technicians will follow and be responsible for bringing the foundry into production. A team of Indian technicians, after training in the UK, will then take over from their British counterparts.

Russia, China Buy UK Steel

MORE than £100,000,000 worth of iron and steel and non-ferrous metals were shipped from the United Kingdom to the planned-economy countries between 1949 and 1959, according to statistics published by the British Council for the Promotion of International Trade.

In this period, £82,742,623 worth of non-ferrous metals were delivered from the UK, mostly after 1954 when embargo restrictions on copper exports to the Eastern block countries were lifted. The Soviet Union bought £57,260,381 worth of non-ferrous metals and China £11,687,987 worth of non-ferrous base metals from British mills.

In the same period, China bought from Britain £12,313,888, and the USSR £8,985,016 worth of iron and steel.

Figures are also given of British textile machinery exports to planned-economy countries, which from 1949 to 1959 totalled £23,955,734, with the Soviet Union the biggest purchaser. In the first 11 months of 1959 the planned-economy countries bought from Britain £4,307,995 worth of textile machinery.

Coal Stocks Position

DETAILS of coal stocks as at January 16, 1960, compared with those available at January 17, 1959, are given in the appended table issued by the Ministry of Power.

Figures in parentheses, mainly calculated on the basis of requirements during the winter, indicate the total weeks which the tonnage in stock would last.

Week ended:—	Jan. 16, 1960.	Jan. 17, 1959.
	Thous. tons.	Thous. tons.
Distributed stocks—		
Public-utility undertakings—		
Gas	2,073 (3.9)	2,582 (4.8)
Electricity	5,861 (5.2)	6,828 (6.5)
Railways	515 (2.5)	669 (3.2)
Coke ovens	1,217 (2.4)	1,272 (2.6)
Industrial consumers—*		
Iron and steel	213 (1.9)	237 (2.1)
Engineering and other metal industries	276 (3.1)	311 (3.5)
Other industries	1,587 (2.8)	1,839 (3.2)
TOTAL INDUSTRIES	2,076	2,387
Merchants' stocks—		
(*a*) House coal	1,337	1,508
(*b*) Anthracite and boiler fuel	186	127
Miscellaneous (estimated)	324	400
TOTAL DISTRIBUTED STOCKS	13,589	15,773
Undistributed stocks—		
At collieries (on ground and in wagons)	28,534	13,960
At open-cast sites	6,804	5,831
TOTAL UNDISTRIBUTED STOCKS	35,338	19,791

* Excluding stocks held by the smaller consumers of less than 1,000 tons per annum.

DERBYSHIRE MINERS HASTENED PIT CLOSURE

MINERS at Woodside Colliery, Ilkeston (Derbyshire), have produced coal so fast—quicker than anyone thought possible—that they have shortened the pit's life by 15 years. Woodside, which employs 700, is now exhausted and is to close at the end of March. The NUM is to call a mass meeting to explain that Woodside and two other collieries in Derbyshire are to be closed to cut coal production by 650,000 tons.

It is understood that there is likely to be little or no redundancy and that alternative jobs will be found for the men from Woodside as well as from Langley and Stanley collieries, which are also to close and from Denby Hall and Renishaw Park where production is to be reduced.

PROMPT ACTION by officials and the lamproom attendant prevented a serious fire at Waterhouses Colliery, near Durham, last Friday. The undermanager, Mr. David Truby, saw flames coming from the electrician's shop as he left for home and with the manager, Mr. J. Hughes, other officials, and the lamproom attendant, brought the fire under control when the Langley Park fire brigade arrived. The pithead, storehouse, and rotary screen are all within a few yards of the outbreak.

Ore Chartering

DESPITE the fact that there is quite a fair miscellaneous demand from the Mediterranean and Spain to UK-Continent, little business is reported fixed from this area, but rates of freight are steady as tonnage is not readily available to meet charterers' requirements. From north Spain tonnage has been fixed to load pyrites residues from Pasajes to the Tees at 30s., with interest maintained. Contract business might be worked for discharge in the river Thames and residues are also quoting from Huelva to west coast UK for January shipment.

Tonnage has been fixed from Monrovia to Emden-Weser Range at 28s. 6d. for about 13,000 tons, February loading, but practically no ore fixtures are reported from any of the normal loading areas. Small tonnage could be fixed from Oxelösund to Newcastle or Goole, magnetite concentrates, but there is no open-market demand for tonnage to load ore from the normal Swedish Baltic ports to this side. Wabana charterers would probably contract over the season to the Continent provided tonnage could be obtained at around about the 17s.-17s. 6d. figure.

There is a moderate demand for tonnage to load phosphate from Casablanca both to east coast and west coast UK and a small inquiry emanates from Sfax.

October Output Rise in Engineering

ENGINEERING and electrical goods industries (excluding shipbuilding, marine engineering, and vehicles) produced slightly more in October than in September, according to the Board of Trade. October production was 13 per cent. higher than October, 1958. Provisional estimates for November suggest that output was higher than a year earlier, but that the increase was less than in October.

The November estimates also indicate that the value of the order-book in these industries has risen for the first time after a long decline. The Board of Trade's index for the end of November stands at 89 (January, 1958=100).

It had remained at 88 throughout most of the middle of the year.

The export order-book had been lengthening since early 1959, but until November there was no equivalent increase in the value of the domestic or order-book.

Third Firm Joins Wheway, Watson & McLean Group

FOLLOWING the amalgamation of Watson & McLean, Limited, Glasgow, and Job Wheway & Son, Limited, Walsall, as from January 1, under the name Wheway, Watson & McLean, Limited, it is announced that a third company, Mechanical Equipments, Limited, Leeds, has joined the group. Each company will continue to operate under its former trading name, and production between the three companies has been rationalized and joint sales representation established.

Wheway, Watson & McLean, Limited, announces the appointment of A. Bond & Company (Edinburgh), Limited, as its representatives covering the Northern (N & C) and the Durham divisions of the National Coal Board. Representation will be based on the firm's office at St. Nicholas Chambers, Newcastle-upon-Tyne 1.

Non-ferrous Metals

Effect of Bank Rate Change

RAISING of Bank Rate by 1 per cent. to 5 per cent. last week made no impact on the copper market in London. On the other hand, it was responsible for lead, zinc, and tin faltering, the argument being that dealers would be less ready to squeeze the market by holding stocks they have to finance at the higher rate of interest.

Copper in London is over £270 a ton, a position due almost entirely to the strikebound copper industry in the United States. London prices have moved up sharply and are the highest for several years.

The US strike position is unchanged. Kennecott has yet to settle outstanding differences with the local craft unions before it can bring into production its important Utah property, and the latest news on this score is that negotiations have been broken off indefinitely. Anaconda, it is said, has broken off negotiations and Phelps Dodge is reported as going towards a settlement at a leisurely pace.

The US Copper Institute's production and stock figures for the month of December make interesting reading. During that month 46,303 tons were produced, against 37,299 tons in November, with stocks showing a fall of about 10,000 tons to 64,763 tons. Outside the United States, production of refined copper amounted to 157,312 tons, against 149,197 tons in November, with stocks down from 236,407 tons to 228,243 tons.

The US price structure is unchanged, with custom smelters quoting 35 cents (equivalent to £280 a ton) and producers quoting 33 cents a pound (£264 a ton). The custom smelter intake price for No. 2 scrap now stands at 26½ cents a pound.

Tin has been a good market in the East, where the price has been rising consistently. The market in New York shows an improvement and the price is now over $1.00 a pound. London faltered on the rise in Bank Rate, but prices have held up well.

Lead is a dull market both in London and in New York. In London the metal has been on offer and the steady trickle of sales has lowered the price. It will be interesting to see if it can recover its recent peak of around £75 a ton. The US price is unchanged at 12 cents a pound.

Zinc continues a good market on both sides of the Atlantic. This market has been helped by the announcement that India is making arrangements to import 10,000 tons over the next two months, and by the continued good level of demand throughout the world for special high grades of the metal—particularly in the US, where it is reported that special high-grade material has been sold forward until next April. The US price is firm at 13 cents a pound.

Official metal prices in London yesterday (Thursday) were:—COPPER, Standard: Prompt £272, forward £255. TIN, Standard: Prompt £794, forward £788 10s. LEAD: Prompt £75, forward £75 5s. ZINC: Prompt £93 15s., forward £92 17s. 6d.

THE SIGNING OF a 20-year agreement covering Soviet deliveries of iron and other metal ores to Czechoslovakia is reported by Moscow Radio. In return, Czechoslovakia has undertaken the delivery to Russia of mining equipment and metal production materials.

Industry and Civil Defence

URGING the setting up of civil defence warden posts in industrial premises with the wardens supplied by the firms concerned, Mr. David Renton, speaking at Sheffield last week, doubted whether public CD services could give an acceptable measure of protection to industry as a whole.

MR. DAVID RENTON

Mr. Renton, who is Joint Parliamentary Under-Secretary, Home Office, was, up to his present appointment in 1958, Parliamentary Secretary to the Ministry of Power for three years. The meeting was promoted by the Sheffield branch of the Society of Industrial Civil Defence Officers and was designed to urge industry to organize its own Civil Defence.

Mr. Renton pointed out that industrial production involved a high concentration of people in a small area and the only alternative to industry organizing its own service was the less preferable one of relying upon the public service. The cost of any equipment and administration would be borne in the first instance by management, but Inland Revenue would allow that cost against gross tax when computing trading profits for tax purposes.

Ald. A. V. Wolstenholme, Lord Mayor of Sheffield, said that only 61 of the 200 largest firms in the city were taking part in industrial CD work.

Acrow Group Acquires Bailey Bridge Firm

WHOLE of the issued capital of Thomas Storey (Engineers), Limited, Stockport, has been acquired by the Acrow (Engineers), Limited, group, London, W.2. Valued at about £715,000, the deal was completed by an exchange of 450,000 £1 shares in Thomas Storey for 220,305 Acrow "A" shares.

Thomas Storey has some 800 employees and owns works covering some 22 acres, with over 250,000 sq. ft. of factory space. It manufactures Bailey bridge components, mining and railway wagon equipment, and diesel and heavy fabricating machinery.

The Acrow chairman, Mr. W. A. de Vigier, envisages much greater use of Bailey bridging equipment with the speed-up of the road building programme.

Trepanner in Polish Pits

FIRST British power-loader of the trepanner type in the Polish coal-mining industry has started work in Brzeszcze Colliery, in the Cracow area, according to Polish Facts and Figures, published by the Polish Embassy in London.

It is planned to import further machines of this type for Polish collieries.

Appointments

Aluminium Merger Changes

PLANS for the merger of Reynolds T.I. Aluminium, Limited, with the British Aluminium Company, Limited, following the acquisition of British Aluminium by Tube Investments, Limited, and Reynolds Metals, of America, are now well advanced and a number of new appointments have been made. They will take effect on Monday and, pending completion of the plans, will cover the operations of both companies.

The British Aluminium changes are:—Mr. GERALD LACEY, commercial director, to be executive director (forward planning); Mr. G. A. ANDERSON, director and general sales manager, to be director of products and development; Mr. J. SALTER, director and general production manager, to be director of engineering, and Mr. W. B. C. PERRYCOSTE, director and general production manager, to be director of production (primary products). Mr. BASIL JAMES, chief executive (sales) of Reynolds T.I. Aluminium, becomes director of sales and Mr. PAUL R. MCGEHEE, chief executive (production), is appointed director of production (manufactured products).

Mr. SIDNEY TINDALE has been appointed general manager (marketing) of the National Benzole Company, Limited, with responsibility for the company's sales and physical operations.

Mr. F. D. G. HOLLINS, labour manager of the Guest Keen Iron & Steel Company, Limited, has been elected chairman of Cardiff Port Employers' Association in succession to Mr. Norman Hockley, Cardiff dock manager.

Mr. CHARLES N. FREESTON has been appointed chief engineer of the Frederick Braby & Company, Limited, London, N.W.1, group of engineering companies. Mr. J. F. NASH has been appointed chief engineer of Auto Diesels, Limited, Uxbridge (Middx), a member of the group.

Mr. SYDNEY BAINBRIDGE, manager of Deaf Hill Colliery (Co. Durham) for the past three years, has been appointed manager of Hylton Colliery, near Sunderland. He was appointed technical assistant at Horden Colliery (Co. Durham) in 1951 and later became undermanager there.

Mr. T. P. D. SPENS, general manager (administration) of Stewarts and Lloyds, Limited, has been appointed a member of Corby Development Committee. Mr. Spens joined the company in 1937, and after war service he returned to Corby as assistant office manager. Later he became office manager and then chief buyer.

In succession to the late Mr. J. G. Day, Mr. L. C. BOWLER has been appointed head of the industrial section of the London and southern sales region of the National Coal Board. Deputy head of the section since the regional selling office was set up, Mr. Bowler was in the London office of the Blackwell Colliery Company, Limited, Alfreton (Derbyshire), before nationalization.

Mr. GORDON BLAIN has been appointed fuel supplies officer to take charge of the fuel supplies branch of the operations department of the Central Electricity Generating Board. In the co-ordination of fuel supplies he will be assisted by Mr. L. A. DIDLICK, who has been appointed fuel officer (supplies and technology), and Mr. J. LAING, who is transport officer responsible for inland and sea transport of fuel. Mr. ARTHUR HAYWOOD, who as revenue purchasing officer was previously responsible for fuel supplies, has retired, but continues to serve the board on a part-time basis in a consultative capacity. Mr. Blain was with Pease & Partners, Limited, Darlington, from 1929 until 1937, when he was appointed assistant secretary to the London Sub-committee of the Midland (Amalgamated) District (Coal Mines) Scheme 1930. He subsequently became London representative of the West Yorkshire Coal Sales Association. In 1939 he returned to the Midland (Amalgamated) District at its London office and in 1942 he transferred to its Sheffield office, returning to London in June of that year and remaining there until 1946. From 1947 to 1949 he was deputy administrative officer of the National Coal Board, relinquishing that appointment to become assistant to the revenue purchasing officer of the British Electricity Authority. He relinquished the same post with the CEGB to take up his new duties as fuel supplies officer. Mr. Didlick was marketing officer (technical) of the South-Western Divisional Coal Board from 1954 until 1957, when he was appointed fuel technologist at the then Central Electricity Authority at headquarters.

Following the recent reorganization of the sales divisions of Crompton Parkinson, Limited, manufacturing electrical engineers, of Guiseley (Yorks), Mr. J. B. SCOTT has been appointed oversea sales director with responsibility for the operation of the oversea division and all the company's oversea selling arrangements. Mr. A. C. TAYLOR has been appointed assistant to the oversea sales director. Mr. Taylor was formerly a director of Greaves Crompton Parkinson, Pakistan, Limited. Mr. C. W. PASS has been appointed manager of the oversea division. He will be responsible for general selling operations. Mr. Pass was previously the company's manager in South America.

Mr. R. THOMSON, who has been appointed manager of the transformer factory of A.E.I. (Rugby), Limited (formerly the British Thomson-Houston Company, Limited), succeeds Mr. G. P. THOMPSON, who has been appointed manager (manufacturing). Mr. Thomson joined BTH in 1939 and has held a number of appointments at both the company's Peterborough and Rugby factories, latterly as superintendent of the transformer factory. Mr. Thomas joined the company as a student apprentice in 1930 and throughout his service has been associated with transformer engineering, studying methods in France and the US. As manager (manufacturing) he succeeds Mr. D. Edmundson, who was appointed general manager recently.

Egyptian Engineers Visit Holman Bros.

TWO engineers of the Egyptian Sinai Manganese Company, Mr. Ahmed Murad Kheirallah, assistant general manager, and Mr. Fawzi Aziz Helmy, chief mechanical engineer, arrived in this country this week. The Sinai Manganese Company plans this year to step up its production to 200,000 tons of run-of-mine manganese ore. A re-equipment programme to bring this about has resulted in the placing of orders with British companies for mining plant, transportation equipment, and spare parts.

First of the orders to be placed is for three Holman Rotair compressors. These compressors, each of 600 c.f.m. capacity, are the first British-built portable rotary screw-type compressors. The Egyptian engineers are spending several days at the Holman Bros., Limited, headquarters at Camborne (Cornwall), where they are attending a technical course on the design and operation of the Rotair and also visiting mines in the area.

African Notes

Iscor's Part in Railway Development

CULMINATION of successful tests carried out with rails of a high manganese content on the Natal main line between Volksrust and Durban has led to the decision by South African Railways to use a rail with a manganese content of up to 2 per cent. on all curves where heavy wear is experienced. An order has been placed with the South African Iron & Steel Corporation, Limited, for the supply of 1,000 tons of 96-lb. rails of this type for delivery during the present financial year.

Rhodesia Railways has also decided to use this type of rail and Iscor is to supply the company with about 1,200 tons a month. Also ordered from Iscor are 54,150 tons of 61-lb. and 81-lb. rails, bringing the amount to be spent this year on rails from the steel works to £1,591,844. In the last financial year the Railways Administration's order for rails was worth some £2,643,750 to Iscor.

Upsurge in Home Steel Demand

Barclay's Bank D.C.O. reports that the high level of demand in South Africa for almost all steel products became more pronounced in December and Iscor not only had to withdraw entirely from the steel export market, but had to revert to the system of allocating certain products. Domestic prices of Iscor products, however, remained unchanged.

Wire products, cold-rolled sheets, and galvanized flat and corrugated sheets remained scarce. There were indications of an increase in the demand for plates, reinforcing bars, and heavy sections and bars and a decided upswing in the demand for tinplate and strip steel also became apparent. The export of pig-iron, surplus to the country's requirements, has continued. The latest available figures indicate that imports of steel into the Union continue at a low level.

"As railway transport is now more or less in free supply," states Mr. B. L. Blaine, chairman of the Transvaal and Delagoa Bay Investment Company, Limited, in his annual review, "it is unlikely that surplus stockpiling will recur." There is, therefore, every reason to expect a steady demand for coal, unaccompanied by violent fluctuations and at a level comparable with 1958-59, in the current financial year.

In relation to the capacity of Witbank Collieries, there has been a shortage of orders since January of last year, states the annual report. Production has been curtailed, but during the year there was an overall improvement of about 100,000 tons in the quantity of coal despatched.

With only seven exceptions, the collieries which supply monthly sales figures showed increased output figures in December, compared with November, and improved sales demand rather than mining capacity is indicated. Of the companies whose financial year ended on December 31, 1959, Springbok and Apex have shown the best improvement on the year, with sales 8.9 per cent. higher than in 1958. Amalgamated and Blesbok have also bettered their previous year's outputs. Coronation, however, had sales amounting to only 86.3 per cent. of the 1958 total.

The first metallurgical plant to use power generated from the Zambesi River has been put into operation by Tow Bros. Ironworks, Limited, at Livingstone. The initial plant installation consists of a 2-ton nominal capacity electric arc furnace for the production of alloy and carbon steel castings. A feature of moulding operations is that zircon sand is being used exclusively for moulds and cores. The sand is being obtained from Umgababa, Natal.

As a result of an agreement South African Railways is to build and operate a 40-mile extension from Sishen to a new terminal at Hotazel, in the Kuruman district, for South African Manganese, Limited. Main traffic on the extension, which will cost about £1,232,000 to build, will be manganese and iron ores. Government approval of the agreement has to be obtained.

The Union's Department of Mines has embarked on an extensive geological survey of beryllium deposits.

The West German firms of Krupp and Demag are to carry out exploratory work in Egypt with a view to opening up the country's mineral resources. The Germans are to supply £135,000 towards the cost on a sterling-for-sterling basis and will prospect for manganese and copper deposits in Eastern Sinai, iron ore along the Red Sea, china clay and feldspar in Sinai, and graphite in the Eastern Desert.

RENEWED HOPE FOR BLACKHILL MINERS

BATTLE of the Berwick-on-Tweed drift mine licence is over. It is almost 12 months since the local Blackhill Colliery was closed and 200 miners made redundant. The National Coal Board granted a drift mine licence to Cllr. Gavin Drummond, branch secretary of the NUM, to help some of the men thrown out of work. Many obstacles were encountered but they would appear to have at last been resolved and Mr. Drummond has agreed to surrender the licence so that it may be reissued to the Elsdon Colliery Company, Limited.

The company has stated that it is prepared to spend £10,000 in starting a drift mine at Allerdean and has given an undertaking to employ only Blackhill miners. Mr. R. MacLellan, manager of the Elsdon Colliery Company, said on Thursday of last week: "We must get a long term lease of the land. We have not yet got the licence, but everything is being arranged."

The drift, which is near the old pit, was closed 30 years ago after flooding. Miners failed in their attempt to form their own company and Mr. Drummond has for some time been urged to re-assign the licence so that negotiations could begin.

£2,000 *Lump Sum Plan for Auchengeich Widows*

EXECUTIVE committee administering the Auchengeich Colliery Disaster Fund has intimated that the 41 widows entitled to benefit should receive lump sums of £2,000. The fund totalled £172,000 and of this, £82,000 provided annuities of £3 a week for the 70 children and dependants of the 47 miners killed on September 18. These annuities will be paid until the children reach the age of 18. The first payments were made on December 1.

The committee also announced other capital grants, ranging from £500 to £2,000, to meet certain family circumstances.

Orders Placed

GEC Vacuum Furnace for BISRA

IN association with Vacuum Industrial Applications, Limited, the General Electric Company, Limited, has received an order for the supply of a vacuum-melting furnace to the British Iron and Steel Research Association for use in its Sheffield laboratories. The furnace has a melting capacity of 56 lb. and is to be used for research into the vacuum melting and casting of ferrous metals. The working pressure of the furnace is one micron Hg. and it is designed for a working temperature of 1,700 deg. C.

The 24-in. diameter furnace chamber is horizontal to provide ample working space and to permit easy cleaning of the inner surface. Within the chamber are dip thermocouples for temperature measurement, and also six tipping buckets for adding alloying metals to the molten charge. The chamber is evacuated by a two-stage pumping system comprising a 10-in. oil booster-diffusion pump backed by a gas-ballasted rotary pump. The pumping speed of this combination is high enough to maintain the chamber pressure under conditions of severe outgassing. The charge is induction heated and the furnace is powered by a 10-k.c. motor-alternator.

WORTH APPROXIMATELY £80,000, an order for 40 units of the Shawnee-Poole system of transport has been placed with Steel Fabricators (Overseas), Limited, London, W.1, by AB Baltzar Klingberg, Stockholm.

DURING THE FIRST two weeks of this year, Brookhirst Igranic, Limited, a member of the Metal Industries, Limited, group, received from the steel industry orders worth more than £150,000 for crane controls. The latest order, worth £50,000, is from Colvilles, Limited, Glasgow, for 14 sets of magnet crane controls. These controls will operate with crane equipments being built for Colvilles by Sir William Arrol & Company, Limited, Glasgow, and George Russell & Company, Limited, Motherwell.

TAYLOR ELECTRICAL INSTRUMENTS, LIMITED, Slough, a company in the Metal Industries, Limited, group, has received orders for more than 4,000 of the new edgewise meters which it introduced shortly before Christmas. The meter, one of the smallest of its type to be manufactured in this country, is finding application in fields as widely differing as an oil refinery in Canada and a stereophonic tape recorder. It is designed for use in crowded control panels, and can be used as a voltmeter, milliammeter, microammeter, ohmmeter, or in similar applications.

AVO, LIMITED, London, S.W.1, a company in the Metal Industries, Limited, group, has secured a contract from the UK Atomic Energy Authority to instal a criticality incident detection system. This system has been designed by the authority for the detection of radiation in the second plutonium processing plant now being installed at its Windscale establishment. Avo instruments were specified. Under the system, it will be possible to determine and localize incidents so as to enable evacuation of the building with minimum risk to personnel.

EXTENSIONS at the Bathgate (West Lothian) factory of the Telegraph Condenser Company, Limited, will extend the floor space by 50,000 sq. ft. The expansion may mean increased employment.

Competition "Menacing" Iron Industry

ALL kinds of competition are menacing the iron industry, members of the Sheffield and district branch of the Institute of British Foundrymen were told at their annual dinner on Monday. The speaker, the Master Cutler, Mr. P. J. C. Bovill, said there was a vital need for iron research and described as "alarming" the drop in revenue of the British Cast Iron Association.

"The future lies in research," he declared, "but greater research efforts need more money. Nevertheless, it is a vicious circle that must be broken."

Mr. Bovill, who is managing director of Newton, Chambers & Company, Limited, said that people were inclined to assume that because ironfounding had been going on for two-and-a-half centuries, it would continue to do so. But "all kinds of competition" menaced the industry. He cited fabrication and the use of aluminium for automobile components.

The president of the Joint Iron Council, Mr. Noel P. Newman, called for co-operation between iron and coal. He referred to large-scale competition between Sheffield and the Midlands for heavy scrap and similar competition between the two industries. But "they must be friends," he stressed. Iron would in the long run only thrive in harmony with steel and pig-iron.

National Council for Technological Awards

NEW chairman of the National Council for Technological Awards in succession to Lord Hives, who has retired, is Sir Harold Roxbee Cox, vice-chairman of the council since its establishment in 1955.

Sir Harold was appointed deputy chairman of the Metal Box Company, Limited, last August and will succeed Sir Robert Barlow, the chairman, when he retires on January 1, 1961. He is also a director of Wilmot-Breeden (Holdings), Limited, Alan Muntz & Company, Limited, Wilmot Breeden, Limited, Boulton Paul Aircraft, Limited, and Telehoist, Limited.

He was associated with the construction of the airship R101 and has been prominent in flight technology, design, and research. He was chairman and managing director of Power Jets (Research & Development), Limited, director of the National Gas Turbine Establishment, chief scientist at the Ministry of Fuel and Power from 1948 to 1954, and a member of the Council for Scientific and Industrial Research. He is vice-president of the British Internal Combustion Engine Research Association.

Lord Hives, who will be 74 in April, is a former chairman of Rolls-Royce, Limited, and a director of Rotol, Limited.

Minister Has Lunch With Sir Ellis

WHEN he visited the Lackenby works of Dorman Long (Steel), Limited, on Thursday of last week, Mr. Richard Wood, Minister of Power, was welcomed by Mr. E. T. Judge, joint managing director. After making an extensive tour of the works the Minister was entertained at lunch by the chairman, Sir Ellis Hunter.

The visit to the Lackenby works came at the end of Mr. Wood's four-day tour of the north-east.

Derbyshire Miners Think the Public Should Know

WITH the aim of disproving "the idea that, after having things all our own way for the past 10 years, miners are now getting a taste of their own medicine," Derbyshire Area of the NUM is to enlist the support of Labour Party groups, trade unions, the Co-operative movement, and affiliated organizations in putting the miners' case before the public. Within the next two months meetings, conferences, and exhibitions are to be held.

"The basic aim is to remove some of the silly ideas held about the question of mining in general," Mr. Bert Wynn, Area general secretary, said. A burning topic will be the coal *v.* oil dispute. "We shall bring facts and figures to prove our case conclusively," Mr. Wynn said on Saturday.

Discussing the national executive's decision to put in a claim for an extra 12s. a week for day-wage workers, the Derbyshire executive flouted officials' advice and censured the national executive for making the claim too low.

It was stated that at present men were "condemned" to £8 17s. 6d. a week for surface work and £9 17s. 6d. underground. Mr. Wynn said delegates felt that because of the five-day week there had been losses in earnings of up to £2 a week, resulting in "relative penury."

Across the county boundary on Monday, Yorkshire miners called for a special national coalfield conference if pay and hours negotiations between the NUM and the NCB became protracted. The Yorkshire Area Council passed a resolution supporting the national executive's wage claims on wages and hours.

There had been a tremendous increase in productivity in the North-Eastern Division of the National Coal Board, said Mr. Alwyn Machen, Yorkshire NUM president.

More was now being produced in five days than under the old six-day agreement and this meant that day-wage workers were dealing with extra coal.

"The wage of £8 17s. 6d. for surface workers, less stoppages, is completely inadequate when one considers the increased productivity and increased work," he said. "Never again must cheap coal mean cheap miners. It is well to remember that British coal is being sold cheaper by £2 to £5 per ton than anywhere else in Europe."

Coal Imports in 1959

IMPORTS of coal, coke, and briquettes into the United Kingdom in 1959 totalled 161,690 tons and were valued at £1,376,054. This compares with 816,641 tons (£7,078,928) in the previous year. December, 1959, imports totalled 7,011 tons, against 55,731 tons in December, 1958, the values, respectively, being £46,891 and £477,815.

Last month's imports came from Commonwealth countries and Eire (6,445 tons), western Germany (544 tons), and other foreign countries (22 tons).

[Imports of fuel into Britain now come mainly from Eire, in the form of peat used to enrich gasworks' coke production. The imports of continental solid fuel noted above were shipped early in 1959 and represent the completion of contracts entered into earlier.]

South African Coal Mine Disaster

MALIGNANT fate appears to dog every effort to establish speedy communication with the 440 miners trapped by a fall of rock 600 ft. underground at the Clydesdale Colliery, Coalbrook, Orange Free State, on Thursday of last week. Rescuers wearing respirators because of the heavy concentration of methane were limited in underground efforts because the rock face is about a mile from the pit bottom and then it is believed to be another mile to the entombed men. Further falls and an explosion underground put the ventilation temporarily out of action and it was eventually decided that rescue by underground means was impossible.

A 15-ton high-speed diamond drill was sent for from north-west Transvaal to sink a 13½-in. borehole down which food, water, medical supplies, and air could be passed to the trapped men. No only did a severe storm delay it on its journey, but caused sand to clog the apparatus when it was set up.

By Monday the drill had penetrated about 120 ft. and then encountered granite-hard rock which slowed it down to less than 2 ft. an hour. Three special tungsten bits arrived from the US on Wednesday. Meanwhile, work has begun on a 12-ft. diameter circular emergency shaft and the Roberts Construction Company, Limited, has been given 10 days to complete the concrete collar before a team of shaft-sinking experts from the Anglo American Corporation, Limited, move in. Unless a major obstacle is encountered, the shaft should reach the men in a month.

Many messages of sympathy were sent following the disaster. The Queen, Mr. Macmillan, Mr. Richard Wood (Minister of Power), the National Association of Colliery Managers, and the Yorkshire Area council of the NUM were among those to express their regret, while a gift of £500 for the miners' dependants has been sent by the Pope.

Pit Accident Was "One in a Million"

AN accident described by the deputy coroner for Newcastle-upon-Tyne, Mr. W. H. Kilner, as "one in a million and particularly unfortunate" was described at a Bedlington inquest last week into the death of Mr. George Williams (49), a miner at Woodhorn Colliery, Ashington (Northumberland).

Mr. Robert A. Charlton said he was working some 10 yds. from Mr. Williams who was operating a new hydraulic jack. Installed in place of pitprops, it was being used in a 2 ft. 9 in. seam. Hearing Mr. Williams call out, Mr. Charlton found him with his head jammed against the seam roof by a piece of metal protruding from the arms of the jack.

In normal circumstances, he said, the machine, which had a pressure of 1,300 lb. per sq. in. was very safe and efficient. In this case the roof was uneven.

A verdict of Accidental Death was recorded.

THE COMMERCIAL engineering division of Microcell, Limited, London, W.C.2, has been formed into a subsidiary company known as Microcell Engineering, Limited. The new company will continue its general engineering work and the production of aircraft passenger seats and aircraft components, etc.

To Examine UK Machine-tool Production

SIR STEUART MITCHELL, Controller of Guided Weapons and Electronics at the Ministry of Aviation, has been appointed chairman of a sub-committee to examine methods of machine-tool production. Mr. John Rodgers, Parliamentary Secretary to the Board of Trade, told the House of Commons on Tuesday that the sub-committee's terms of reference would be:—

"To consider the report by Prof. Melman, prepared for European Productivity Agency Project, No. 420, and to report to the Machine Tool Advisory Council what action can usefully be taken by the UK machine tool industry on his recommendations."

Prof. Melman's report, which has never been officially published, is understood to conclude that the west European machine-tool industry is technically backward, neglectful of research, and in danger of being ousted by Soviet competition from world markets. Mr. Hugh Gaitskell commented that not to publish a report of this kind could only create the worst suspicions that something was seriously wrong in the industry.

Mr. Douglas Jay asked for an assurance that the sub-committee's report would be published. Mr. Rodgers replied that the proceedings and reports of the Advisory Council were confidential, but some public statement would be made on the sub-committee's findings.

Other members of the sub-committee are:—Mr. R. W. Asquith, Asquith Machine Tool Corporation, Limited: Mr. W. J. Carron, president of the Amalgamated Engineering Union; Col. C. W. Clark, managing director of C.W.C. Equipment, Limited, fluorescent lighting and aircraft component manufacturers, of Maidenhead (Berks), and a director of a number of companies; Mr. R. C. Giggins, a director of the General Electric Company, Limited, Pirelli-General Cable Works, Limited, and Siemens & General Electric Railway Signal Company, Limited; Mr. E. T. Grainger, Board of Trade; Mr. J. G. Lloyd, Vickers-Armstrongs (Engineers), Limited; Mr. J. B. L. Munro, Board of Trade; Mr. R. D. G. Ryder, Thomas Ryder & Son, Limited, machine-tool and textile roller makers, of Bolton (Lancs); Mr. A. Siddall, Joseph Lucas (Electrical) Company, Limited, and Mr. K. D. Rogers, Board of Trade (secretary).

UNIVERSAL BEAM MILL FOR APPLEBY-FRODINGHAM

CONTRACT for a high-duty universal beam mill has been awarded to Schloemann, AG, Düsseldorf, by the Appleby-Frodingham Steel Company (branch of the United Steel Companies, Limited), Scunthorpe (Lincs).

Universal mill stands have to be employed in the manufacture of beams with parallel flanges and mechanical and electrical equipment has to conform to particularly exacting requirements. The mill for Appleby-Frodingham has to be capable of rolling beams with parallel flanges having webs from 8 in. to 24 in. deep.

The new mill consists of a universal mill stand, edging stand, roller tables, and saw line. The plant is due to go into operation in the summer of 1961 and it is proposed to supplement it at a later stage by the addition of a further mill stand.

Deadlock in Engineering Wage Claim

UNIONS and employers reached deadlock on Tuesday in their resumed negotiations on engineering pay and hours. The unions rejected the employers' improved offer to reduce the working week from 44 to 42 hours—the original offer was 42¼ hours—and the employers rejected the unions' claim for £1 a week more.

Leaders of the Confederation of Shipbuilding and Engineering Unions are calling a special meeting of executives of the 39 affiliated unions in York on February 11 to discuss the next move. In addition, a joint committee is to be set up, at the employers' suggestion, to discuss the implications of reducing working hours.

This committee will meet on February 8 so that union executives will have the full facts before them at the York meeting.

At Tuesday's talks, Mr. Benjamin Macarty, director of the Engineering and Allied Employers' Federation, said that less than 1 per cent. of skilled workers were on the minimum rate of £8 6s. 8d. and that the proposed reduction of two hours would add about £80,000,000 a year to their costs.

Asquith Machine Tool Maintains Dividend

AS forecast, the Asquith Machine Tool Corporation, Limited, has a final dividend of 10 per cent., making 15 per cent. for the year ended September 30, 1959, on a capital increased by a one-for-one scrip issue and by the Kitchen & Wade, Limited, acquisition. Allowing for the scrip issue, this is the same equivalent as for the previous year.

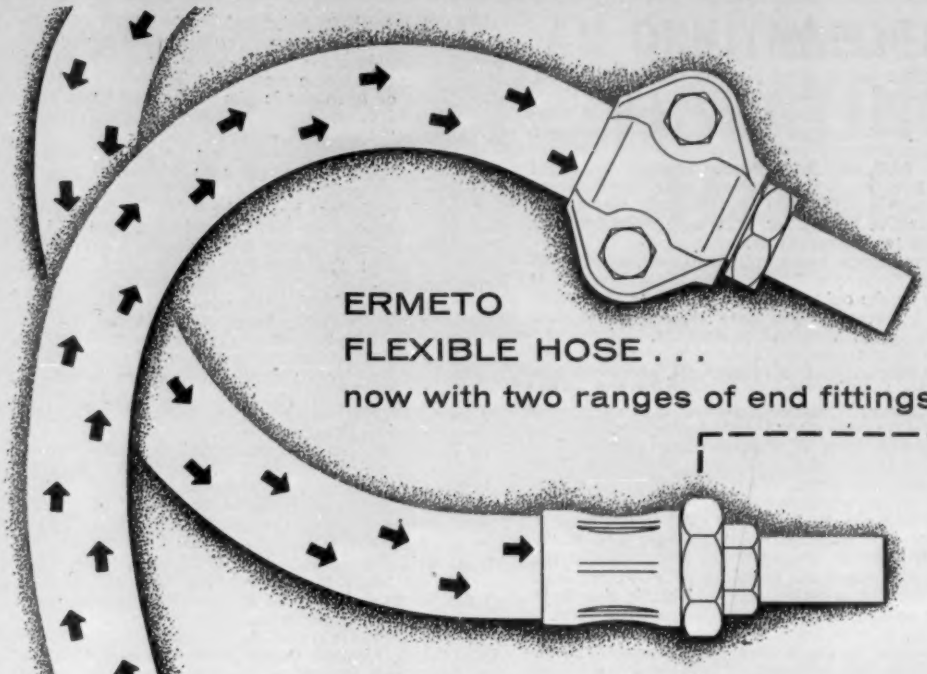
After all charges except tax, group profit amounted to £563,475, against £815,105. Tax takes £249,500 (£441,400), leaving a group net profit of £313,975 (£373,705), of which £282,107 (£369,107) is attributable to the parent. Group profit for 1958-59 includes 12 months' profit of new subsidiaries acquired during the year, amounting to £127,555.

Because of the trading position to date, no interim dividend will be declared in July, and the directors cannot forecast the rate of dividend likely to be paid for the current year. The order-book has further deteriorated during the past year and the foundation of profits for that year was due to the backlog of orders which has now been largely eradicated.

Collaboration on Continuous Casting Processes

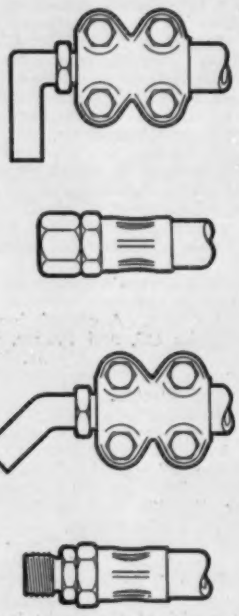
AGREEMENT for technical collaboration has been reached between the Continuous Casting Company, Limited, Weybridge (Surrey), and Low Moor Alloy Steelworks, Limited, Bradford. Over a number of years, the Low Moor company has developed in its own works the continuous casting of stainless and alloy steel slabs, blooms, and billets.

The Weybridge company, which is associated with the Davy & United Engineering Company, Limited, and Newton, Chambers & Company, Limited, is a licensee for the British Iron and Steel Research Association processes of continuous casting.



ERMETO
FLEXIBLE HOSE . . .
now with two ranges of end fittings

To meet the increasing demand for high pressure flexible hose and hose units, The British Ermeto Corporation are marketing a pre-swaged hose end in addition to the existing twin-saddle type. For both types a wide selection of end fittings are available: 90° and 135° bends, B.S.P. male and female ends, captive nuts, etc., in addition to the straight standpipe end which can be used with standard Ermeto fittings. Hose can be supplied for hydraulic, pneumatic and steam, and chemical applications, in continuous lengths of up to 60 ft. Technical advice and information gladly supplied on request.



ERMETO

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A MEMBER OF THE ALENCO GROUP OF COMPANIES

News in Brief

THE BIGGEST ball-bearing plant in the Soviet Union is to be opened in Stalingrad. Said to be far more advanced than other plants both in Russia and elsewhere the plant incorporates underground conveyor belts for materials and parts.

DURING 1959, B.I.S.C. (Ore), Limited, imported 2,719,700 tons of iron and manganese ore through Middlesbrough and 251,000 tons through Hartlepool. The comparative figures for 1958 were 2,708,000 tons and 493,000 tons, respectively.

AN UPRIGHT CHAIR made entirely of coal, which is to be sold at Sotheby's, London, on February 12, is believed to be the only one of its kind to be auctioned. It is not, however, unique, as a chair made of coal was among Queen Victoria's possessions.

RUMANIA IS PLANNING to increase industrial production in the current year to 14 per cent. above the last year's total. Among 1960 targets are 1,400,000 metric tons of pig-iron, 1,700,000 tons of raw steel, and 1,100,000 metric tons of rolled steel products.

A THREE-MAN TEAM of Russian experts has arrived in Ghana to explore the possibilities of setting up an iron and steel mill there. They will carry out a geological survey in northern Ghana, where deposits of high-grade iron ore are known to exist in quantity.

ABOUT 20 MEN employed in the sleeper mill of the Workington Iron & Steel Company (branch of the United Steel Companies, Limited), Workington, have begun a four-day working week. This is due to a hold-up in settling details of two oversea contracts.

FIRST RISE in steel prices in Australia since 1956 has been announced by the Broken Hill Proprietary Company, Limited. The increases, of between 5 and 7½ per cent. a ton, follow closely on a recent rise in wage margins of 28 per cent. granted to metal trades workers.

A SUBSIDIARY formed by Richardsons, Westgarth & Company, Limited, engineers and boilermakers, etc., of Wallsend-on-Tyne, with offices in Washington, D.C., will act as selling agents in the United States and will also be the main contractor where plant is made in America to Richardsons, Westgarth designs.

J. H. FENNER & COMPANY, LIMITED, power transmission engineers, of Marfleet, Hull, announces the formation in Johannesburg of J. H. Fenner & Company, Africa (Pty), Limited, which plans, in conjunction with Reunert & Lenz, Limited, the manufacture of a range of mechanical power transmission goods in South Africa.

BID FOR A YEAR'S EXTENSION of the order to get rid of his coal and steel holdings has been won by Herr Alfried Krupp. A commission representing Germany, Britain, the US, and France, with a Swiss chairman, postponed until January 31, 1961, a divestment order issued by the three western allies. This is the second deferment granted.

AMERICAN ATOMIC REACTORS for research in universities and hospitals are to be built and sold in the UK by Vickers-Armstrongs, Limited, under licence from the US General Dynamics Corporation's atomic division. The reactors, known as Triga and costing under £100,000, will be built at the Vickers' South Marston works (Wilts).

THE Steel Peech & Tozer branch of the United Steel Companies, Limited, Rotherham, is starting an intensive civil defence wardens' section training course for assistant managers and senior shift foremen. A scale model of the works is being used in the programme of lectures and exercises. Rescue and fire section courses will follow.

LONG-PLANNED Ruhr coal-mining action group—Aktionsgemeinschaft Ruhrbergbau—has been officially formed, and although there is no obligation for colliery companies to join the group, all Ruhr producers are stated to have become members. The aim of AR is the closure of uneconomic pits in the Ruhr and helping members to overcome problems consequent upon the closures.

WILMOT BREEDEN, LIMITED, car component makers, of Birmingham, has taken over Hazelwell Works, Stirchley, the former factory of Veritys, Limited. The 125,000-sq. ft. factory should be in production by the end of the year and several hundred people will be employed there. It is to be equipped with modern automatic plant for forming, cutting, and finishing components.

LIQUIDATION of the Rhenish-Westphalian Coal Syndicate, set up under orders of the Allied Military Government in September, 1945, is now complete. The liquidators' final accounts were presented to the member pits of the former syndicate in Essen last week. The final assets of the syndicate are being disposed of by way of the administration company Montana Verwaltungsgesellschaft mbH.

A FOUR-DAY working week, affecting about 140 men, is to be introduced by Head Wrightson & Company, Limited, at part of its Stockton-on-Tees forge. The firm has stated that recent recession in the capital development of heavy industries had reduced orders for other north-east firms as well as influencing the Head Wrightson programme. The opportunity was now being taken to improve the technical facilities of the Stockton forge and the firm's general situation was now more encouraging.

SALES, ADMINISTRATION, and accounts departments of Solus-Schall, Limited, manufacturers of equipment for non-destructive testing of materials, etc., are now at County Building, Honeypot Lane, Stanmore, Middx (telephone: WORdsworth 4300). It is planned to transfer the remainder of the organization to the same address within the next few months. The service department will, for the time being, continue to operate from 15/18, Clipstone Street, London, W.1 (telephone: MUSeum 5080).

US Nears Record for Steel Outlay

A NEAR-RECORD $1,600,000,000 (£571,000,000) for mill expansion and new equipment in 1960 has been budgeted by US steel companies. The American Iron and Steel Institute reports that this figure is $640,000,000 more than was spent on capital facilities last year, and only $150,000,000 less than the all-time record outlays in 1957.

However, the institute points out that because of inflated costs of labour and materials the projected 1960 outlay would buy "substantially" less than in 1957.

According to preliminary estimates, the United States Steel Corporation had a net income of $253,900,000 in 1959, equivalent to $4.24 a share. The figure the previous year was $301,500,000, equivalent to $5.13 a share. The regular quarterly dividend of 75 cents a share has been declared. Output in 1959 was 24,445,353 net tons, compared with 23,818,889 tons in 1958.

Steel production in the US this week is estimated by the American Iron and Steel Institute at 2,717,000 tons, compared with 2,727,000 tons last week and 2,178,000 tons in the corresponding week of last year.

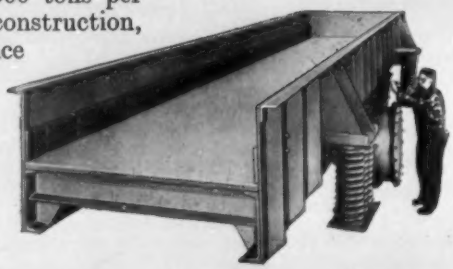
The ingot index is 169.1 per cent., compared with 169.8 per cent. last week and 135.6 per cent. last year.

AN ORNITHOLOGICAL VIBRATING FEEDER

The Humming Bird, which gets its name from the humming noise made by the rapid vibration of its wings as it hovers whilst feeding.

THE HEWITT ROBINS EXTRA HEAVY DUTY VIBRATING feeder

Capable of handling from 4 up to 4,000 tons per hour and distinguished by heavy-duty construction, simplicity of design, low-cost maintenance and reliable continuous operation under the most exacting site conditions. Write or 'phone for full technical data.



The illustration alongside shows a 4 ft. by 23 ft. long ELIPTEX FEEDER Handling 450 tons per hour copper ore.

STONE-WALLWORK LIMITED

(VIBRATING EQUIPMENT DIVISION)

32, VICTORIA STREET, LONDON, S.W.1. Tel: Abbey 7681. Grams: "Stonwalabb" Sowest, London

Board Changes

UNITED GAS INDUSTRIES, LIMITED—Mr. P. P. MacDiarmid has resigned from the board.

POLLARD BALL & ROLLER BEARING COMPANY, LIMITED—Mr. A. C. E. Marsh has joined the board.

RICHARDS BROS. & SONS, LIMITED—Mr. W. Muller and Mr. E. D. Morley have been elected to the board.

TOLEDO WOODHEAD (SPRINGS), LIMITED—Mr. Walter P. Yaneske, chief engineer, has been appointed to the board as technical director.

MARTIN BROS. (MACHINERY), LIMITED—Mr. W. H. Chetham has been co-opted to the board in the place of Mr. G. Duke. who has resigned.

LONG EATON CABLE COMPANY, LIMITED—Mr. Joseph C. Austin, Mr. Kenneth Flood, and Mr. A. Richard Lockey have been appointed directors.

TUNNEL PORTLAND CEMENT COMPANY, LIMITED—Mr. F. A. Leathers has been appointed a director in place of Mr. S. V. Hagdrup, who has retired.

MOBIL OIL COMPANY, LIMITED—Mr. Curtis M. Klaerner has been appointed a director in place of Mr. Arthur L. Lanckton, who has resigned.

NORTH CENTRAL WAGON & FINANCE COMPANY, LIMITED—Sir Giles Guthrie has been appointed deputy chairman. He has been a director since 1947.

ARMORDUCT CABLE COMPANY, LIMITED—Mr. Denis Wood-Dow, Mr. Edward G. Glover, and Mr. A. Richard Lockey have been appointed directors.

UNION STEEL & MANUFACTURING COMPANY, LIMITED—Mr. W. R. Boffey, Mr. B. V. Haggett, and Mr. A. J. Cartwright have been appointed additional directors.

BRITISH ENGINE BOILER & ELECTRICAL INSURANCE COMPANY, LIMITED—Mr. R. R. Mason has been appointed a director. He retires as general manager on April 30 and will be succeeded by Mr. K. W. Bradshaw as from May 1.

BELLOW MACHINE COMPANY, LIMITED—Mr. G. Borwell, works manager, Mr. E. Hurwitz, company secretary, and Mr. E. M. Hyman, sales manager, have been appointed directors. They will all continue in their previous capacities.

SUPERHEATER COMPANY, LIMITED—Mr. Eric A. Robinson, chairman and joint managing director, who is retiring from the position of joint managing director this weekend, will remain chairman of the company. Mr. L. C. Southcott, joint managing director, will become managing director.

LANDMASTER, LIMITED—Mr. A. Booth, general manager, Mr. F. Bedworth, home sales director, Mr. E. W. Lee, technical director, Mr. H. T. Jones, works director, and Mr. R. Wijewardene, director, South East Asia, all of whom have served as executive directors for some years, have been appointed to the main board of the company, which is a member of the Firth Cleveland, Limited, group.

TAP & DIE CORPORATION, LIMITED—Mr. Charles J. Shuttleworth has been appointed to the board. Mr. D. G. N. Lloyd-Lowles has been appointed chairman, and Mr. H. E. Lane and Mr. R. J. Scott to the board, of the International Twist Drill Company, Limited. Mr. L. J. Gibson has been appointed chairman and Mr. P. Nuckey to the board of John Harris Tools, Limited. The two latter companies were recently acquired by the Tap & Die Corporation.

TOTAL OUTPUT of pig-iron from the "Elizabeth" blast furnace of Stewarts and Lloyds' works at Bilston (Staffs) has topped the 1,000,000-ton mark. "Elizabeth" began operating in December, 1954.

Record Year for Massey-Ferguson

GROUP world-wide sales amounting to $491,947,763 ($440,100,000) constitute a record for Massey-Ferguson, Limited, agricultural machinery and tractor manufacturers, of Toronto, Canada. Profit before tax was $27,164,144 ($21,712,151). Net income per common share was $1.65 on the 12,075,911 shares outstanding at October 31, 1959, compared with $1.25 on 9,552,248 shares the previous year.

Improved results were due primarily, the directors state, to continued strengthening of North American operations, where net sales increased 24 per cent. in the US and 38 per cent. in Canada. There was also a significant overall reduction in cost of goods sold from 81.2 per cent. of world-wide net sales to 79.6 per cent. The acquisition during the year of F. Perkins, Limited, outstanding British manufacturers of high-speed diesel engines and of tractor assets in the UK and France, are described by Col. W. E. Phillips, chairman and chief executive officer, and Mr. A. A. Thornbrough, president, as the most far-reaching steps ever undertaken by the company to integrate and strengthen its world-wide manufacturing operations.

The acquisition of tractor plants established the company as the largest manufacturer of farm tractors in the world market. The company expects to maintain its competitive position in North America, but sales may be below 1959's record level. However, no major change is anticipated and the net effect overall seems to indicate a slight increase in 1960 consolidated net sales.

Triplex Plans Permanent Capital Move

AN issue of permanent capital to reduce temporary borrowings which had largely financed the several acquisitions since 1955 by Triplex Foundry, Limited, Tipton (Staffs), was mentioned by the chairman, Mr. W. H. L. Harrison, when he gave members details of the acquisition of Vowles Bros., Limited, foundrymen, of West Bromwich. He said it was intended to make the issue in the near future subject to favourable marketing conditions.

Vowles Bros. was acquired for £275,000 cash on January 1 through the Triplex subsidiary, Vowles Aluminium Foundry Company, Limited. Its net assets at July 31, 1959, are given as £236,738, and its profits, before tax, for the year to July 31, 1959, as £42,111 (£32,938 for 1957-58).

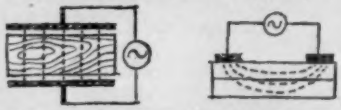
It was proposed, said Mr. Harrison, to create an additional 2,000,000 ordinary 5s. shares, which the board considered adequate to cover the proposed issue and future requirements. Present authorized and issued ordinary was £200,000.

Mr. Harrison added that this acquisition meant that the Triplex group now owned all the freehold industrial site occupied by the Vowles companies, and was in a position to take immediate advantage of the expansion of industry generally and in particular the motor-car industry with which the group was closely linked. The group's prosperity in this field must to a large extent depend on its ability to expand quickly, he said.

Electrical Aids in Industry *Data Sheet* **No. 10**

Dielectric Heating - 1

When an electrically non-conducting material is placed between two metal plates, called electrodes, connected to an A.C. supply, the alternating electrostatic field between the electrodes considerably speeds up the molecular movements in the material (termed a 'dielectric') as a result of which the temperature of the material under treatment rises. A similar effect is produced



where the two electrodes are positioned on the same side of the dielectric; in this case the electrostatic field between them is generally known as a 'stray' or 'fringe' field. For industrial application, the applied voltage of the order of 15,000 volts supplied by an electronic generator alternates at frequencies of some millions of cycles per second.

The amount of heat generated in the dielectric is determined by the frequency, the square of the applied voltage, the dimensions of the object and a physical property of the material termed 'loss factor' and is represented by the equation :

Power $= 1{\cdot}41\ E^2\ f.F.\ \frac{A}{t} \times 10^{-15}$ kW.

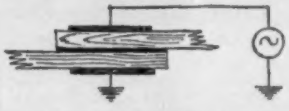
Where E = applied voltage,
f = frequency, F = loss factor.
A = area of the dielectric in square inches.
t = thickness of the dielectric in inches.
F, the loss factor, is itself equal to the expression K Cos Ø in which :
K = the dielectric constant of the material,
Cos Ø = the dielectric power factor of the material.

Therefore, 'loss factor' is a property of the material and a measure of the ease with which it can be heated by this method. Like other physical properties, it varies considerably for different substances. The equation shows that the heat generated in a dielectric is proportional to its loss factor, but the rate of rise of temperature will also depend upon its specific heat and density. The following table gives approximate values of the dielectric constant, power factor and loss factor of a few typical dielectric materials for frequencies around a million cycles a second.

MATERIAL	DIELECTRIC CONSTANT	POWER FACTOR	LOSS FACTOR
Natural Rubber	2·9	0·02	0·058
Oak, dry	3·3	0·04	0·132
P.V.C.	5·3	0·06	0·318
Nylon	3·7	0·05	0·185
Water, pure	80·0	0·03	2·40
Water, tap	80·0	0·5/5·0	40/400

The high loss factor of water means that materials which are difficult to heat when completely dry will often heat efficiently when moisture is present. The voltage must be increased towards the end of the process in some cases to remove the final moisture traces, the reduction in loss factor as the material dries out providing a safeguard against overheating.

If the workpiece is made up of a number of materials, each material will heat up uniformly but each at a rate depending upon its loss factor, thermal properties and density. The degree of temperature uniformity throughout the workpiece will then depend upon the extent to which thermal conductivity can equalise different rates of heating.



Such different rates of heating can be turned to good account in certain applications. For example, in wood glue setting, the glue lines heat up much more rapidly than the wood pieces being joined and the glue sets before the wood heats up substantially, wood having a lower loss factor than glue.

For further information get in touch with your Electricity Board or write direct to the Electrical Development Association, 2 Savoy Hill, London, W.C.2. Tel : TEMple Bar 9434.

Excellent reference books on electricity and productivity (8/6 each, or 9/- post free) are available — "Induction and Dielectric Heating" is an example.

E.D.A. also have available on free loan in the United Kingdom a series of films on the industrial uses of electricity. Ask for a catalogue.

6776/4

Exports of British Coal

DETAILS of British coal exports and bunker coal shipments in December, and the totals for 1959 and 1958, are given below.

	Month ended Dec. 31.	Year ended December 31.	
	1959.	1958.	1959.
	Tons.	Tons.	Tons.
Categories.			
Anthracite—			
Large	11,062	88,455	99,554
Graded	23,383	255,935	255,447
Cleaned smalls	21,432	320,042	117,950
All other	30,676	398,339	340,540
Steam coal (including household)—			
Unscreened	3,728	127,274	32,157
Large	71,011	382,068	298,166
Graded	22,413	415,905	272,893
Cleaned smalls	63,895	404,563	454,621
Untreated smalls	56,570	595,824	794,683
Other	10,478	396,370	209,588
Gas coal—			
Unscreened	11,816	126,919	146,704
Large	2,004	83,274	4,277
Graded	10,877	238,592	264,734
All other	2,554	12,129	26,069
Coking coal—			
Cleaned smalls	2,329	28,870	32,615
Other	6,175	122,654	129,298
TOTAL	350,403	3,997,213	3,479,296
Destinations.			
Canada	—	59,380	87,109
Other Commonwealth countries	2,502	19,321	11,829
Eire	99,220	808,531	815,385
Finland	525	63,977	40,619
Sweden	17,928	161,341	189,712
Norway	9,732	64,449	88,840
Denmark	76,105	919,018	986,886
Western Germany	14,991	204,380	193,266
Netherlands	40,313	536,550	362,860
Belgium	39,442	352,703	313,865
France	24,129	476,258	218,774
Portugal	6,785	35,290	40,996
Italy	15,210	26,573	86,758
Egypt	—	2	20
Argentina	—	192,624	15,737
Other foreign countries	3,521	76,816	26,640
Fuel taken on board vessels engaged in the foreign trade (including fishing vessels) for their own use—			
British flag	30,415	782,709	584,735
Other flags	3,362	57,453	48,768

Exports of Coke and Patent Fuel

THE following table gives figures of exports of coke and manufactured fuel from the United Kingdom during December, and the totals for 1959 and 1958.

Products.	Month ended Dec. 31.	Year ended December 31.	
	1959.	1958.	1959.
	Tons.	Tons.	Tons.
Gas coke	53,563	682,454	607,637
Hard coke	50,643	316,996	346,416
Breeze	24,517	392,387	411,640
Manufactured fuel	6,902	144,627	133,556
TOTAL	135,625	1,536,464	1,499,249

Imports and Exports of Mining Machinery

ACCORDING to Board of Trade returns, mining machinery (other than portable power tools) valued at £65,577 was imported during December, compared with £120,547 in December, 1958. Imports in 1959 were valued at £1,377,550, against £2,997,946 in the previous year.

The appended table contains figures of export values of mining and well-drilling machinery in December, and values for 1959 and 1958.

Destination.	Month ended Dec. 31.	Year ended December 31.	
	1959.	1958.	1959.
	£	£	£
Union of South Africa	47,086	417,753	577,037
Rhodesia and Nyasaland	1,157	271,151	112,700
India	148,417	893,388	1,512,271
Australia	20,328	439,482	291,270
Canada	33,607	405,974	281,551
Trinidad	61,634	722,980	390,489
Other Commonwealth countries and Eire	118,067	1,843,916	1,273,431
Netherlands	6,976	376,956	195,237
France	5,893	183,985	182,299
Venezuela	10,412	231,705	193,247
Other foreign countries	466,675	2,972,618	4,584,957
TOTALS.			
Well-drilling machinery—			
Petroleum	403,897	3,559,547	4,681,786
Other	68,419	444,577	389,645
Mining machinery (excluding portable power tools)—			
Coal-cutters, power-operated—			
Complete	34,320	416,411	451,515
Parts	50,196	738,957	671,622
Conveyors, underground—			
Complete and parts	143,203	1,078,860	1,180,074
Winders, power operated—			
Complete	5,611	97,228	99,580
Parts	15,919	343,940	257,570
All other	198,687	2,080,388	1,862,697
TOTAL	920,252	8,759,908	9,594,489

Industrial Expansion May Stimulate Swansea Port's Trade

LACK of continental demand and the consequent reduction in coal exports meant a decrease of 199,000 tons of trade for Swansea port, said Mr. G. C. B. Shaddick, chairman of the Swansea Port Employers' Association, at a meeting of the association on Thursday of last week. There had been a progressive fall in tonnage handled since 1955 and last year imports dropped by about 82,000 tons and exports by 383,000 tons.

Mr. Shaddick, however, felt there was more hope for the future with the progressive expansion of certain industries in and around Swansea, particularly the forward planning of the Steel Company of Wales, Limited.

MONDAY MARKS the 50th anniversary of the opening of the National Labour Exchanges in Great Britain. They were established in 1910 under the Labour Exchanges Act, 1909, introduced into Parliament by Sir Winston Churchill, then President of the Board of Trade.

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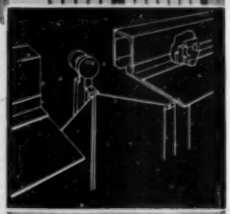

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Imports and Exports of Iron and Steel

FIGURES of imports and exports of iron and steel in December are given in the following tables, which are based on Board of Trade returns.

Totals for 1959 and for the previous year are also included.

Total Exports of Iron and Steel

Destination.	Month ended Dec. 31.	Year ended December 31.	
	1959.	1958.	1959.
	Tons.	Tons.	Tons.
Cyprus	160	5,131	1,684
Sierra Leone	426	11,789	9,132
Ghana	2,087	15,702	25,943
Nigeria	6,668	73,161	74,534
Union of South Africa	5,790	104,654	43,946
Rhodesia and Nyasaland	1,918	32,230	21,283
Tanganyika	1,486	20,006	19,264
Kenya	2,402	41,377	26,188
Uganda	185	3,380	4,090
Mauritius	198	3,749	1,792
Aden	230	2,779	3,063
Bahrein, Qatar, and Trucial States	1,688	9,415	9,417
Kuwait	215	41,125	9,730
India	19,004	179,362	210,743
Pakistan	7,422	53,800	48,528
Singapore	818	32,748	21,674
Malaya	1,421	15,630	10,944
Ceylon	1,868	30,094	36,138
British North Borneo	421	2,311	2,931
Hongkong	6,319	59,336	68,432
Australia	8,167	107,580	86,937
New Zealand	9,136	188,634	103,463
Canada	15,390	189,239	230,098
Jamaica	2,314	22,409	22,223
Trinidad	2,502	50,557	39,562
British Guiana	576	6,788	6,661
Other Commonwealth countries	2,658	51,498	36,626
Eire	5,926	49,200	51,230
Soviet Union	3,589	21,936	33,302
Finland	4,166	49,486	38,551
Sweden	16,935	125,457	134,560
Norway	10,948	91,738	100,230
Denmark	9,182	83,828	96,470
Western Germany	25,596	62,519	133,632
Netherlands	12,931	81,868	106,162
Belgium	6,702	38,191	39,844
France	800	4,325	6,085
Switzerland	981	9,022	8,863
Portugal	952	15,278	14,819
Spain	865	41,440	25,565
Italy	3,761	40,734	46,264
Austria	245	9,059	4,505
Yugoslavia	547	4,642	5,715
Greece	1,143	12,810	11,107
Turkey	695	4,012	5,441
Netherlands Antilles	192	2,205	3,283
Portuguese East Africa	317	2,585	1,685
Egypt	1,022	12,692	7,170
Sudan	1,186	32,369	7,694
Lebanon	178	8,701	4,069
Israel	1,585	9,044	14,359
Saudi Arabia	219	3,771	3,219
Iraq	1,208	41,373	74,292
Iran	2,508	38,178	38,591
Burma	656	11,909	8,720
Thailand	545	6,769	7,920
Indonesia	1,702	2,273	10,017
Philippine Republic	251	3,573	8,390
USA	27,659	87,352	208,254
Cuba	1,429	6,731	8,836
Colombia	1,019	5,239	5,918
Venezuela	2,865	73,066	64,325
Ecuador	148	2,298	1,040
Peru	330	9,902	3,055
Chile	184	4,888	1,547
Uruguay	1,699	920	3,444
Argentina	10,189	155,592	194,703
Other foreign countries	60,364	154,104	389,945
TOTAL	324,948	2,775,563	3,107,947

Total Imports of Iron and Steel

From	Month ended Dec. 31.	Year ended December 31.	
	1959.	1958.	1959.
	Tons.	Tons.	Tons.
Rhodesia and Nyasaland	499	6,183	5,383
Canada	4,648	22,667	22,791
Other Commonwealth countries and Eire	4,410	23,145	42,930
Soviet Union	12,064	108,935	66,745
Sweden	2,986	34,289	30,826
Norway	9,874	70,388	91,233
Poland	880	319	5,553
Western Germany	8,696	64,881	78,884
Netherlands	14,037	147,486	165,037
Belgium	2,581	88,586	23,056
Luxembourg	1,261	6,097	7,484
France	4,123	18,934	26,152
Italy	1,176	7,085	13,510
Austria	759	3,842	4,537
Japan	510	3,683	2,747
USA	3,553	115,435	28,837
Other foreign countries	2,264	8,041	13,613
TOTAL	74,321	729,996	627,318
Iron and steel scrap and waste, fit only for the recovery of metal	69	64,142	2,746

Exports of Iron and Steel by Products

Product.	Month ended, Dec. 31.	Year ended December 31.	
	1959.	1958.	1959.
	Tons.	Tons.	Tons.
Pig-iron	32,076	151,687	157,884
Ferro-columbium (niobium)	9	37	71
Ferro-tungsten	100	993	1,259
Other ferro-alloys	454	3,417	9,408
Ingots, blooms, billets, slabs, sheet bars (incl. tinplate bars), and similar primary forms	9,794	21,746	82,660
Pieces roughly shaped by forging*	131	7,149	1,420
Iron bars, rods, angles, shapes, and sections	130	1,673	2,869
Steel bars, rods, angles, sections, and shapes	66,123	334,605	543,337
Iron plates and sheets	28	1,826	1,670
Universal plates	339	4,326	8,177
Steel plate, 3mm. and under 4.5mm. thickness	2,956	9,987	40,000
Ditto, 4.5mm. or more in thickness	30,096	172,614	228,297
Blacksheets and blackplate	27,730	295,258	287,810
Hoop and strip	8,031	80,512	83,923
Tinplate	44,959	414,013	468,065
Decorated tinplate	502	6,972	8,131
Galvanized sheets	8,902	87,472	85,683
Other (incl. tinned sheets, terneplate, and ternesheets)	2,982	13,592	22,037
Railway and tramway construction material	11,290	272,338	164,845
Wire rods of steel (incl. alloy steel)	3,989	49,034	49,412
Wire	9,484	102,462	109,422
Tubes, pipes, and fittings	64,843	743,850	751,567
TOTAL	324,948	2,775,563	3,107,947

* The figures for 1959 are not completely comparable with those for previous years.

FACTORY EXTENSIONS on the Bede Trading Estate, South Shields, for Fry's Diecastings, Limited, should be ready by the end of May and will provide work for 55 men and women. Another extension there, for Sterling Foundry Specialities, Limited, will employ 60 men. A 6,000 sq. ft. extension is also planned for Verichrome Plating Services (Scotland), Limited, which took over a factory on the estate last autumn.